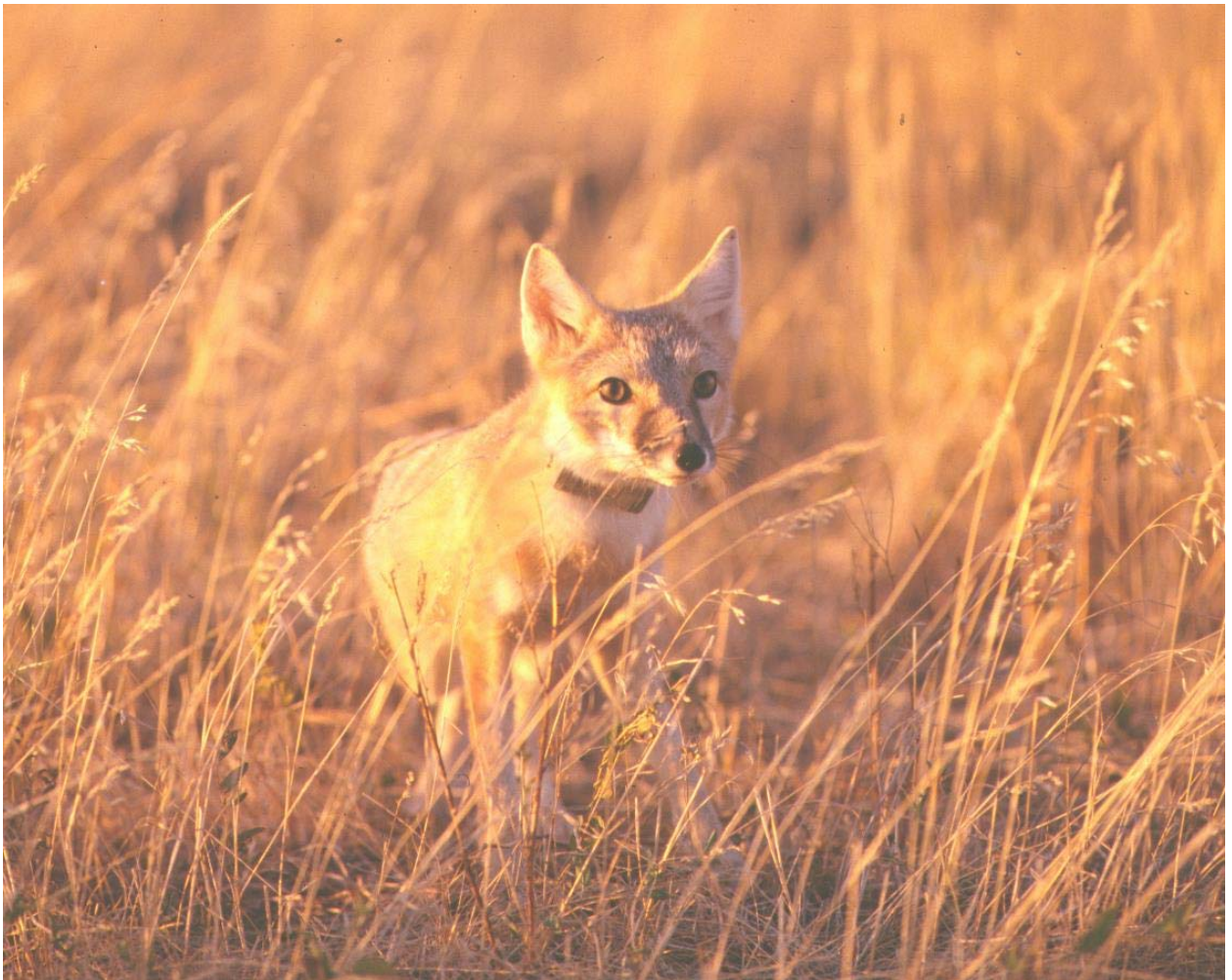


SWIFT FOX CONSERVATION TEAM



ANNUAL REPORT FOR 2004

**SWIFT FOX CONSERVATION TEAM:
ANNUAL REPORT FOR 2004**

COMPILED AND EDITED BY:

**James N. Stuart
New Mexico Department of Game and Fish**

and

**Sam Wilson
Nebraska Game and Parks Commission**

January 2006



Please cite this publication as:

Stuart, J.N. and S. Wilson (editors). 2006. Swift Fox Conservation Team: Annual Report for 2004. New Mexico Department of Game and Fish, Santa Fe, New Mexico. Nebraska Game and Parks Commission, Lincoln, Nebraska.

For additional copies, contact:

Conservation Services Division, New Mexico Department of Game and Fish, PO Box 25112, Santa Fe, New Mexico 87504. Tel: 505-476-8101. Research Analysis/Inventory, Nebraska Game and Parks Commission, P.O. Box 30370, Lincoln, Nebraska 68503. Tel. 402-471-0641. A limited number of hard copies of this report have been printed. The report also is available as a PDF document.

Photographs – *Cover*: Released swift fox with radio collar at Badlands National Park, South Dakota (courtesy of Dan Licht, National Park Service). *This page*: Swift fox at Buffalo Gap National Grassland (Fall River District), South Dakota (courtesy of L.A. Hetlet).

TABLE OF CONTENTS

Introduction and Overview	iv
Swift Fox Conservation Team Members	v
Swift Fox Conservation Team Participating Cooperators	viii
Swift Fox Conservation Team Interested Parties.....	x

STATE AGENCIES

Colorado

Monitoring swift fox populations in eastern Colorado Francie Pusateri.....	1
---	---

Kansas

Swift fox investigations in Kansas, 2004 Matt Peek	4
---	---

Montana

Swift fox monitoring activities in Montana Brian Giddings	7
--	---

Nebraska

Nebraska swift fox report, 2004 Sam Wilson.....	10
--	----

New Mexico

Swift fox research in New Mexico: 2004 update James N. Stuart	11
--	----

North Dakota

North Dakota swift fox annual report, 2004 Jacquie R. Ermer	14
--	----

Oklahoma

Swift fox investigations in Oklahoma, 2004 Julianne Whitaker Hoagland.....	15
---	----

South Dakota

South Dakota swift fox report, 2004 Eileen Dowd Stukel	21
---	----

Texas

Texas swift fox report 2004 Heather Whitlaw	22
--	----

Wyoming

Wyoming swift fox completion report (15 April 2004 – 14 April 2005) Martin Grenier, Laurie Van Fleet, Rob Stephens, Todd Filipi, and Daniel Webber	23
--	----

FEDERAL AGENCIES

APHIS Wildlife Services

Report of APHIS Wildlife Services nontarget take of swift fox and kit fox Jeff Green.....	34
--	----

National Park Service

Swift fox in National Park Service units Dan Licht	35
---	----

U.S. Forest Service

Summary of swift fox information for the National Grasslands, 2004 Bob Hodorff.....	42
Pawnee National Grassland swift fox survey for 2004 Richard E. Hill	44
2004 swift fox survey: Fall River Ranger District, Buffalo Gap National Grassland, Nebraska National Forest Lynn Allan Hetlet	50

REINTRODUCTION SITE UPDATES

Fort Peck Indian Reservation, Montana

Ensuring restoration of swift fox on the Ft. Peck Indian Reservation and in northeastern Montana Kyran Kunkel, Robert Magnon, and Les Bighorn.....	60
--	----

Blackfeet Indian Reservation, Montana

Swift fox reintroduction on the Blackfeet Indian Reservation, Montana: determining success David E. Ausband	61
---	----

Kainai (Blood Tribe) Lands, Alberta

Update on Kainai (Blood Tribe) Reintroduction Programme Clio Smeeton.....	63
--	----

Lower Brule Sioux Reservation, South Dakota

Swift fox reintroduction feasibility study – Lower Brule Sioux Tribe Shaun M. Grassel	65
--	----

OTHER RESEARCH ON SWIFT FOX

The influence of habitat fragmentation on swift fox (<i>Vulpes velox</i>) distribution, habitat utilization and genetic diversity in Texas Donelle Schwalm, Warren Ballard, Ernest B. Fish, Robert Baker, and Heather Whitlaw	69
Importance of artificial escape cover for increasing swift fox populations in northwest Texas Brady K. McGee, Warren B. Ballard, and Kerry Nicholson	73
Swift fox (<i>Vulpes velox</i>) occurrences in black-tailed prairie dog (<i>Cynomys ludovicianus</i>) towns in the northwestern panhandle of Texas Kerry Nicholson, Warren B. Ballard, and Brady K. McGee	74

SFCT ANNUAL MEETING – KANSAS CITY, KANSAS

Minutes from the 2005 Annual Meeting, Swift Fox Conservation Team Eileen Dowd Stukel and Julianne Whitaker Hoagland	75
--	----

INTRODUCTION AND OVERVIEW

JAMES N. STUART, editor, New Mexico Department of Game and Fish, PO Box 25112, Santa Fe, NM 87504

SAM WILSON, editor, Nebraska Game and Parks Commission, 2200 North 33rd, Lincoln, NE 68503

The Swift Fox Conservation Team (SFCT) was established in 1994 by the state wildlife agencies in the 10 states in which swift fox occurs or formerly occurred. The SFCT was created following the 1992 release of the petition for the U.S. Fish and Wildlife Service (Service) to list the swift fox as Threatened under the Endangered Species Act (ESA). The Service's first 12-month finding, in 1995, stated that the swift fox was warranted but precluded for listing by higher priorities. As a result, the swift fox was placed on the ESA Candidate List. This decision afforded the SFCT additional time to complete the *Conservation Assessment and Conservation Strategy for Swift Fox in the United States* (CACS; Kahn et al. 1997) in September 1997 and to begin implementing the tasks outlined in the CACS.

Since 1997, the SFCT and the agencies and individuals involved have been successful in addressing conservation needs of the swift fox. In particular, improved management, research, and conservation of the swift fox by SFCT members and cooperators have resulted in a more comprehensive accounting of the distribution and a better understanding of habitat requirements of this species. These efforts led to the removal of the swift fox from the ESA Candidate List in January 2001. In addition, due to the attainment of several important goals outlined in the CACS, the SFCT has begun efforts towards updating the document by Kahn et al. (1997). Over the past decade, the SFCT has remained committed to precluding the need to list the species under the ESA through effective management by agencies, tribes, private organizations, and other entities.

Since 1994, the SFCT members and cooperators have met every year except 2004 to report on their management and research activities. This document, the 10th annual report produced by the SFCT, represents a compilation of those reports provided by the SFCT for 2004. The purpose of this document is to provide a summary of ongoing species status research, conservation efforts, and progress by state and federal agencies, tribes, and other organizations and individuals in achieving the goals set forth in the CACS.

LITERATURE CITED

Kahn, R., L. Fox, P. Horner, B. Giddings, and C. Roy. 1997. Conservation assessment and conservation strategy for swift fox in the United States. Colorado Division of Wildlife, Fort Collins, Colorado. ix + 54 pp.

SWIFT FOX CONSERVATION TEAM

STATE AGENCIES:

Kansas

Matt Peek

Kansas Department of Wildlife and Parks
P.O. Box 1525
Emporia, KS 66801
Phone: 620-342-0658
FAX: 620-342-6248
Email: mattp@wp.state.ks.us

Montana

Brian Giddings

Montana Fish Wildlife and Parks
PO Box 200701
Helena, MT 59620-0701
Phone: 406-444-0042
FAX: 406-444-4952
Email: bgiddings@state.mt.us

Nebraska

Sam Wilson

Nebraska Game and Parks Commission
2200 N. 33rd
Lincoln, NE 68503
Phone: 402-471-5174
FAX: 402-471-5528
Email: swilson@ngpc.state.ne.us

New Mexico

Jim Stuart

New Mexico Dept of Game and Fish
PO Box 25112
Santa Fe, NM 87504
Phone: 505-476-8107
FAX: 505-476-8128
Email: james.stuart@state.nm.us

Oklahoma

Julianne Whitaker Hoagland

Oklahoma Dept of Wildlife Conservation
1801 N. Lincoln Blvd
Oklahoma City, OK 73105
Phone: 405-522-0189
FAX: 405-521-6535
Email: jhoagland@odwc.state.ok.us

South Dakota

Eileen Dowd Stukel

South Dakota Dept Game, Fish and Parks
523 E Capitol
Pierre, SD 57501
Phone: 605-773-4229
FAX: 605-773-6245
Email: eileen.dowdStukel@state.sd.us

Texas

Heather Whitlaw

Texas Parks and Wildlife Department
Box 42125, TTU
Lubbock, TX 79409-2125
Phone: 806-742-6888, ext 242
FAX: 806-742-2280
Email: heather.whitlaw@tpwd.state.tx.us

Wyoming

Martin Grenier

Wyoming Game and Fish Department
260 Buena Vista
Lander, WY 82520
Phone: 307-332-2688, ext 230
FAX: 307-332-6669
Email: martin.grenier@wgf.state.wy.us

North Dakota

Dorothy Fecske

North Dakota Game and Fish Department
100 N Bismarck Expressway
Bismarck, ND 58501-5095
Phone: 701-328-6302
Fax: 701-328-6352

Colorado

Francie Pusateri

Colorado Division of Wildlife
317 W. Prospect Rd
Fort Collins, CO 80526
Phone: 970-472-4336
Fax: 970-472-4458
Email: francie.pusateri@state.co.us

FEDERAL AGENCIES

U.S. Fish and Wildlife Service

Pete Gober

USFWS Ecological Service
420 S. Garfield Suite 400
Pierre, SD 57501
Phone: 605-224-8693 ext 24
FAX: 605-224-9974
Email: pete_gober@fws.gov

Bureau of Land Management

Cal McCluskey

Bureau of Land Management
Washington Office- W. Field Staff
1387 S. Vinnell Way
Boise, ID 83709
Phone:
Email: cal_mccluskey@blm.gov

U.S.G.S./Biological Resources Division

Marsha A. Sovada

Northern Prairie Wildlife Research Center
8711 37th Street SE
Jamestown, ND 58401
Phone: 701-253-5506
FAX: 701-253-5553
Email: marsha_sovada@usgs.gov

National Park Service

Dan Licht

NPS
Mount Rushmore National Memorial
P.O. Box 268, Hwy 244
Keystone, SD 57751
Phone: 605-574-5266
Cell: 605-421-9235
Fax: 605-574-2173
Email: dan_licht@nps.gov

U.S. Forest Service

Bob Hodorff

U.S. Forest Service
Fall River Ranger District
PO Box 732
Hot Springs, SD 57747
Phone: 605-745-4107
FAX: 605-745-4179
Email: rhodorff@fs.fed.us

USDA/APHIS/Wildlife Services

Jeffrey Green

WS Western Regional Office
2150 Centre Ave, Bldg B
Mail Stop 3W9
Fort Collins, CO 80526
Phone: 970-494-7453
FAX: 970-494-7455
Email: jeffrey.s.green@aphis.usda.gov

NRCS

Vacant

CANADA**Pat Fargey**

Grasslands National Park

Box 150

Val Marie, SK S0N 2T0

Phone: 306-298-2166, ext. 224

Fax: 306-298-4505

Email: pat.fargey@pc.gc.ca

Axel Moehrenschrager

Centre for Conservation Research

Calgary Zoo

1300 Zoo Road NE

Calgary, AB T2E 7V6

Phone: 403-232-7771

Email: axelm@calgaryzoo.ab.ca

Team Chairs

Brian Giddings - Montana

Francie Pusateri - Colorado (Co-Chair)

Committee Chairs

Research - Marsha Sovada - USGS

Habitat - Julianne Hoagland - OK

Education - Eileen Dowd Stukel -SD

SWIFT FOX CONSERVATION TEAM
PARTICIPATING COOPERATORS

Lu Carbyn

Canadian Wildlife Service
4999 98th Avenue
Edmonton, AB T6B 2X3
Phone: 403-435-7357
FAX: 403-435-7359
Email: lu.carbyn@ec.gc.ca

Julie Moore

Bureau of Land Management
1849 C St NW, LS-204
Washington, DC 20240
Phone: 202-452-7746
FAX: 202-452-7702
Email:

Marilyn McBirney

Swift Fox SSP Coordinator, Canid TAG
Pueblo Zoo (CO), General Curator
3455 Nuckolls Ave
Pueblo, CO 81005
Phone: 719-561-1452 x107
Email: curator@pueblozoo.org

Robert Harrison

University of New Mexico
Dept. of Biology
Albuquerque, NM 87131
Phone: 505-277-3411
FAX: 505-277-0304
Email: rharrison@unm.edu

Fred Lindzey

Wyoming Coop Unit
Box 3166
Laramie, WY 82071
Phone: 307-766-5415
FAX: 307-766-5400
Email: flindzey@uwyo.edu

Bill Andelt

Department of Fishery and Wildlife Biology
Colorado State University
Fort Collins, CO 80523
Phone: 970-491-7093
FAX: 970-491-5091
Email: billan@picea.cnr.colostate.edu

Steve Brechtel

Alberta Fish and Wildlife Division
9945-108 Street
Edmonton, AB T5K 2G9
Phone: 403-422-9535
FAX: 403-422-9785
Email:

Greg Linscombe

Fur Resources Committee, IAFWA
Louisiana Dept. of Wildlife and Fisheries
2415 Darnell Road
New Iberia, LA 70560
Phone: 318-373-0174
Email:

Greg Schroeder

Badlands National Park
PO Box 6
Interior, SD 57750
Phone: 605-433-5269
Email: greg_schroeder@nps.gov

Clio Smeeton

Cochrane Ecological Institute
PO Box 484
Cochrane, AB T4C 1A7
Phone: 403-932-5632
FAX: 403-932-6303
Email: cei@cadvision.com

Kevin Honness

Turner Endangered Species Fund
PO Box 1118
Fort Pierre, SD 57532
Phone: 605-843-2842
Email: honness@wcenet.com

Kyran Kunkel

1123 Research Drive
Bozeman, MT 59718
Phone: 406-556-8500
FAX: 406-556-8501
Email: kyran@montana.net

Minette Johnson

Defenders of Wildlife
114 West Pine Street
Missoula, MT 59802
Phone: 406-549-4103
FAX: 406-549-3306
Email: mjohnson@defenders.org

Shaun Grassel

Lower Brule Sioux Tribe
P.O. Box 246
Lower Brule, SD 57548
Phone: 605-473-5666
Cell: 208-305-2230
Email: shaung@cableone.net

SWIFT FOX CONSERVATION TEAM

INTERESTED PARTIES

Jack Grisham

Smithsonian's Natl Zool. Park
3001 Connecticut Ave NW
Washington, D.C. 20008
Phone: 202-673-4799
Fax: 202-673-4766
Email: grishamj@si.edu

Bruce Durtsche

Bureau of Land Management
Denver, CO
Phone: 303-236-6310
Email: bdurtsch@blm.gov

Dave Roberts

USDI-Bureau of Land Management
Wyoming State Office
5353 Yellowstone Road
Cheyenne, WY 82009
Phone: 307-775-6099
FAX: 307-775-6082
Email: dave_a_roberts@blm.gov

Shawn Sartorius

USFWS / ES
Billings Sub-office
2900 4th Ave
Billings, MT 59101
Phone: 406-247-7369
Email: shawn_sartorius@fws.gov

Roxanne Falise

BLM- Montana/Dakota
500 Southgate Dr.
Billings, MT 59107
Phone: 406-896-5025
Email: rfalise@blm.gov

William H. Gill

USFWS
315 Houston ST, Ste E
Manhattan, KS 66502
Phone: 785-539-3474
Email: william_gill@fws.gov

Cara Meinke

USGS- BRD FRESC
970 Lusk St.
Boise, ID 83706
Phone: 208-426-2696
Email: cmeinke@usgs.gov

Jonathan Proctor

Predator Conservation Alliance
2900 E 23rd Ave, Gate 7
Denver, CO 80205
Phone: 303-376-4982
Fax: 303-376-4806
Email: jonathan@predatorconservation.org

Rickey Gilliland

USDA/APHIS/Wildlife Services

P.O. Box 60277 WTAMU

Canyon, TX 79016

Phone: 806-651-2880

Email:

Rickey.L.Gilliland@aphis.usda.gov

Kim Shotola

Swift Fox Studbook Keeper

Houston Zoo, Inc.

1513 N. MacGregor

Houston, TX 77030

Phone: 713-533-6645

Email: kshotola@houstonzoo.org

Deb O'Neill

Prairie Dog Conservation Team

P.O. Box 3553

525 East Kelly

Jackson, WY 83001

Phone: 307-690-5938

FAX: 866-382-8953

Email: pdogdoneill@aol.com

MONITORING SWIFT FOX POPULATIONS IN EASTERN COLORADO (EXECUTIVE SUMMARY)

FRANCIE PUSATERI, Colorado Division of Wildlife, 317 W. Prospect, Fort Collins, CO 80526. Tel: 970-472-4336; FAX: 970-472-4457; E-mail: francie.pusateri@state.co.us

A perceived decline of and paucity of information on populations of the swift fox (*Vulpes velox*) led to a 1992 petition of the U.S. Fish and Wildlife Service (USFWS) to list the species under the Endangered Species Act of 1973 (ESA). Establishment of and preliminary findings from the Swift Fox Conservation Team (SFCT) lead the USFWS in 1995 to deem the swift fox warranted but precluded from listing under the ESA. The Colorado Division of Wildlife (CDOW) funded research from 1995–1997 that resulted in a new methodology to survey swift fox over a large geographic area relative to previous studies (Finley 1999, Finley et al. 2005), and plans to continue this effort at 5 year intervals.

TRANSLOCATION

Because populations of swift fox in the northern plains were greatly diminished or extirpated, the CDOW is cooperating with Badlands National Park (BNP) to reintroduce swift foxes in South Dakota. In 2004, 28 swift fox were captured from 6–12 October in eastern Colorado and translocated to BNP. This was the second year of a three year effort to establish a viable population of swift fox in BNP, and added to the 30 swift foxes translocated to BNP from Colorado in 2003. Some swift foxes released in 2003 bred successfully in 2004.

POPULATION MONITORING

Based on the methods of Finley (1999), swift foxes were monitored in eastern Colorado from 31 August 2004–12 February 2005. Following objectives of the SFCT, we: 1) estimated occupancy rates of 12 mi² plots, 2) estimated geographic distribution, 3) indexed population size, and 4) tested for seroprevalence of diseases in swift foxes.

Cage-traps were set on 51 randomly selected 12 mi² grids, each comprised of 20 traps and run three consecutive nights. Effective trapping effort totaled 3,008 trap nights (TN). We captured 136 swift fox on 36 (71%) grids, including 12 recaptures. Mean capture success was 4.1 swift fox/100 TN (initial captures only), or 4.5 swift fox/100 TN including recaptures. This is slightly lower than the 4.6 swift fox/100 TN (initial captures only) and 6.1 swift fox/100 TN (including recaptures) reported by Finley (1999).

The percent of grids occupied by swift foxes in eastern Colorado does not appear to have changed since a comparable sample was taken of 72 grids in March 1995–January 1997 (Finley et al. 2005). Summing the predicted occupancy values across the sampled grids for the respective studies, Finley et al. (2005) found $\hat{\psi} = 0.790$ (SE = 0.0574), whereas this study found $\hat{\psi} = 0.742$ (SE = 0.0869), providing an estimated change of -0.048 (SE = 0.104, 95% CI -0.252

– 0.156). This difference is well within the sampling variation of the estimates, and does not indicate a change in swift fox populations in eastern Colorado.

The mean number of swift foxes estimated per 12 mi² grid for all 51 grids was 4.83 (SE = 1.990, 95% CI 0.933 – 8.735), ranging from zero to 26. However, this estimate should be used only as an index of swift fox populations because the trapping grid attracts foxes from some unknown distance outside the trapping grid, and thus is a biased estimate of true density.

DISEASE MONITORING

Blood samples were collected from swift foxes to evaluate seroprevalance to select infectious diseases. Serum samples were tested for antibodies to plague, tularemia, canine parvovirus (CPV) and canine distemper virus (CDV). However, titers were not measured for all four agents in every sample due to limited volumes of sera. CPV titers only were measured in foxes captured for the BNP translocation effort. We interpreted titers as indicating prior exposure to the pathogens listed, but not necessarily reflecting active infection or disease in test-positive swift foxes.

Tularemia, caused by the bacterium *Francisella tularensis*, has a broad host range but is primarily a pathogen of lagomorphs and rodents. Of 107 swift foxes samples tested in this study, only 9 (8%) had antibodies for tularemia. For comparison, disease monitoring efforts in the Wolf Creek Management Area in northwestern Colorado during 2000–2004 revealed tularemia seroprevalence in coyotes as high as 20–40%.

Plague (*Yersinia pestis*) is a reportable disease to which canids are relatively resistant, and therefore a good sentinel species. However, plague can be highly fatal in many of Colorado's other native species including prairie dogs (*Cynomys ludovicianus*), black-footed ferrets (*Mustela nigripes*), and lynx (*Lynx canadensis*). The primary epizootic hosts of plague are rodents, and transmission is primarily through flea vectors. However, in carnivores exposure can also occur through consumption of infected prey. Antibody titers indicative of plague exposure were present in 21% of swift foxes sampled.

Canine distemper is a contagious disease caused by a morbillivirus. Distemper is another disease of significance to some threatened and endangered species, most notably black-footed ferrets. No antibody titers to CDV were detected in swift foxes sampled, although the samples screened for CDV were all from a relatively small portion of the overall survey area. Miller et al. (2000) reported 18% seroprevalence to CDV in 22 swift foxes sampled in Colorado and 13% in 97 swift and kit foxes (*V. macrotis*) sampled throughout 7 western states.

Canine parvovirus titers are commonly found in domestic and wild canids. Although many canids and some felids are susceptible to disease associated with CPV infection, no cases have been documented in swift foxes. Of 28 swift foxes screened, 17 (61%) had titers to CPV.

LITERATURE CITED

- Finley, D.J. 1999. Distribution of the swift fox (*Vulpes velox*) on the eastern plains of Colorado. M.A. Thesis, University of Northern Colorado, Greeley.
- Finley, D. J., G. C. White, and J. P. Fitzgerald. 2005. Estimation of swift fox population size and occupancy rates in eastern Colorado. *Journal of Wildlife Management*. In Press.
- Miller, D. S., D. F. Covell, R. G. McLean, W. J. Adrian, M. Niezgoda, J. M. Gustafson, O. J. Rongstad. 2000. Serologic survey for selected infectious disease agents in swift and kit foxes from the western United States. *Journal of Wildlife Diseases* 36:798–805.

SWIFT FOX INVESTIGATIONS IN KANSAS, 2004

MATT PEEK, Kansas Department of Wildlife and Parks, 1830 Merchant, Emporia, KS 66801.
Tel: 620-342-0658; FAX: 620-342-6248; E-mail: mattp@wp.state.ks.us

Swift fox populations and harvests are monitored through multiple techniques in Kansas. The most reliable and important of these include roadside track surveys, pelt tagging records, and observation records of Kansas Department of Wildlife and Parks (KDWP) employees. In 2004, these three techniques resulted in documentation of swift fox in 22 Kansas counties (Figure 1).

Systematic roadside track surveys were first conducted under the current protocol from 1997 to 1999 (see Sovada et. al., 2001). A second survey period was initiated in 2002, with the intent of surveying for three consecutive years as was done previously. The 2004 survey period concluded this 3-year cycle. Over the entire period, 290 townships within 24 counties were searched. Repeated searches were conducted in most townships where swift fox tracks were not identified during the previous year's survey. Over the course of the survey, swift fox were documented in 156 (54%) of the townships searched. These townships were located within 23 of the 24 counties surveyed. Seward County was the only county searched where swift fox tracks were not located. Complete analysis of the results has not yet been conducted.

KDWP initiated a pelt tagging program in 1994 to acquire more precise information on swift fox distribution and harvest than had been achieved through the annual Furbearer Harvest Survey. Any swift fox taken in Kansas must be presented to KDWP for tagging within seven days of the close of the season. The number of swift fox presented annually to KDWP for pelt tagging since the tagging program was initiated is presented in Figure 2. In 2004-05, 86 swift fox were harvested in 10 counties in Kansas. For a more detailed account of swift fox harvest characteristics, see Peek, 2002 or Peek, 2004. Because furbearer harvest pressures in westernmost Kansas are very light and swift foxes are often a species of secondary harvest interest (i.e. not the trapper's primary target), caution should be exercised in making any assumption about swift fox populations based on harvest levels.

As part of an effort to better monitor swift fox distribution in Kansas, KDWP employees have been asked to report all swift fox observations made annually since 1995. Occasionally reports from non-Department employees that can either be verified (i.e. by photos) or are from individuals known to be competent in swift fox identification (i.e. track survey participators) are included with KDWP employee reports as well. In 2004, 103 reports were documented from within 15 Kansas counties. Road-killed foxes were documented in 56 of the reports. The remaining 47 reports accounted for live foxes. Multiple foxes were observed in several of the reports, such that the 47 live-fox reports actually accounted for 71 foxes. The 103 reports are the most by KDWP employees since this process was initiated.

LITERATURE CITED

Peek, M. S. 2004. Swift fox investigations in Kansas, 2003. Pp. 42-47, in Grenier, M. and H. Whitlaw, ed., Swift Fox Conservation Team 2003 Annual Report. Wyoming Game and Fish Department, Lander, WY.

Peek, M. S. 2002. Kansas swift fox pelt tagging analysis, 1994-95 through 2001-02 seasons. Pp. 42-47, in Peek, M.S., ed., Swift Fox Conservation Team 2001 Annual Report. Kansas Department of Wildlife and Parks. Emporia, KS.

Sovada, M. A., G. A. Sargeant, A. L. Zimmerman, and C. Roy. 2001. Kansas swift fox track survey method analysis, 1997-1999. Unpublished.

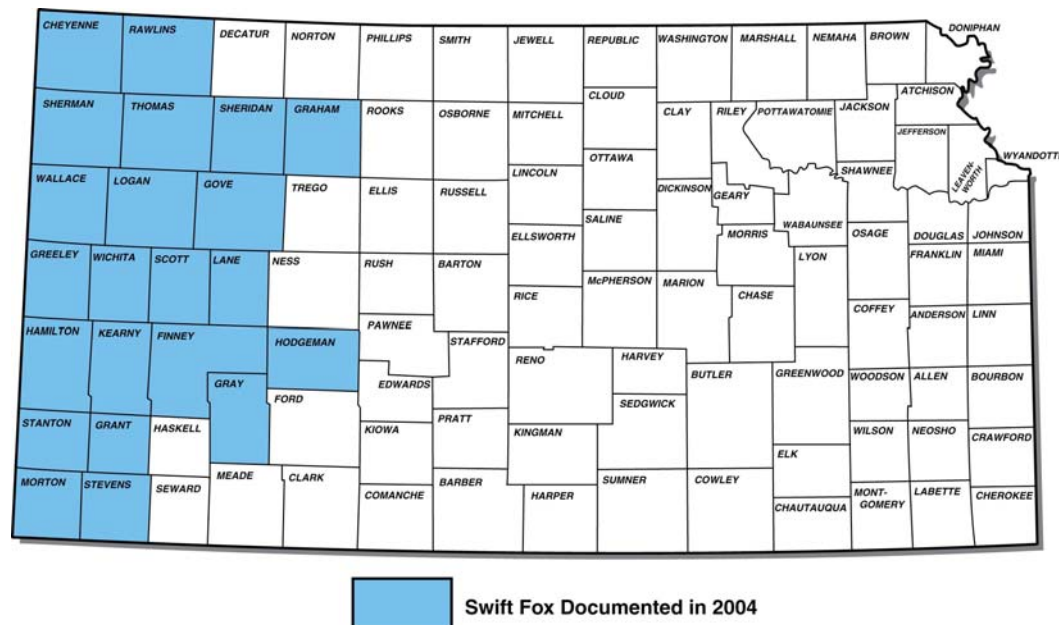


Figure 1. Kansas counties in which swift fox were documented in 2004 by track searches, pelt tagging records, and KDWP employee observation reports.

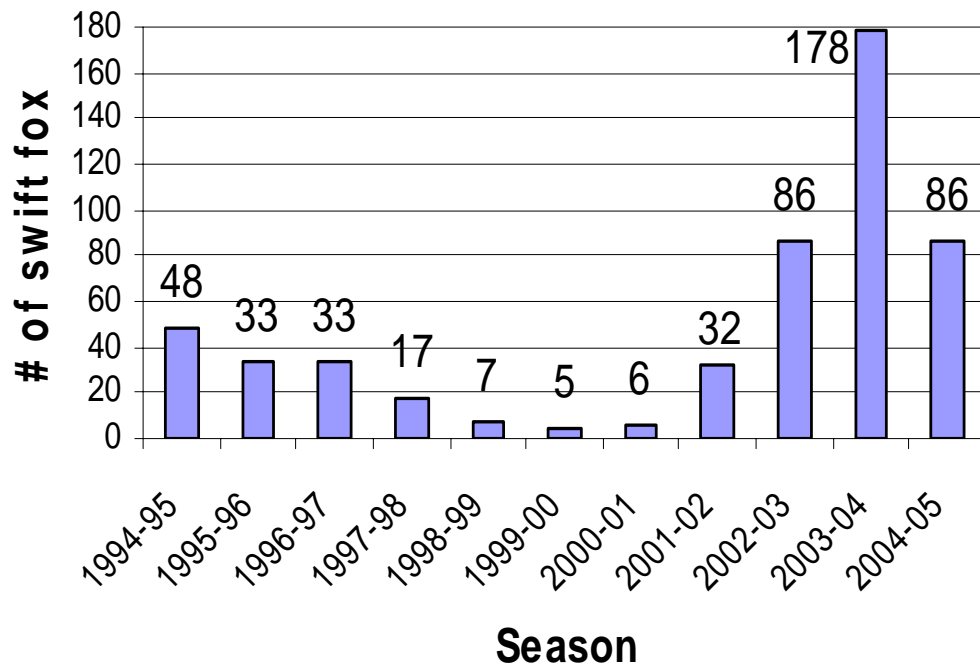


Figure 2. Number of swift fox pelt tagged by KDWP during the 1994-95 through 2004-05 furbearer seasons in Kansas.

SWIFT FOX MONITORING ACTIVITIES IN MONTANA

BRIAN GIDDINGS, Montana Department of Fish, Wildlife and Parks, P.O. Box 200701,
Helena, MT 59620-0701. Tel: 406-444-0042; FAX: 406-444-4952; E-mail:
bgiddings@mt.gov

ABSTRACT

Monitoring activities during the 2004 report period consisted of collecting swift fox occurrence reports that included several which document swift fox population expansion into habitat that has been unoccupied since the early 1900s. Federal BLM grant funds were redistributed to Canada to support final analysis of the 2000-01 international census and to the USGS Northern Prairie Wildlife Research Center to complete a national swift fox habitat modeling project.

INTRODUCTION

Management direction to date has been to monitor species distribution and relative population size for swift fox in the state by periodically measuring changes through survey and inventory activities. Additional focus is being placed on land management conservation efforts that promote swift fox population expansion and the maintenance of prairie landscape that could serve as corridors for natural dispersal to connect northern populations, at least genetically, to the larger and more contiguous continental swift fox population. No major survey activities were conducted during 2004, although swift fox occurrence reports are collected at variable rates on an annual basis. Montana continues to meet objectives outlined in the national Swift Fox Conservation Assessment and Conservation Strategy (Kahn et al. 1997).

METHODS

Fish, Wildlife & Parks (FWP) collected swift fox observational data from trappers, landowners, agency biologists and the public within the various prairie habitats of the state through standard FWP furbearer occurrence/distribution reports in a continuing effort to monitor changing swift fox status in the state. These reports provide site-specific location information, which can be added to the existing FWP swift fox database and used to annually update the species distribution map. Specimens of incidentally taken swift fox are also collected from resident coyote trappers to provide location data and biological samples for examination and analysis. Approximately \$28,000 in federal BLM grant funds remaining after the 2000-01 international swift fox census (Moehrenschrager and Moehrenschrager 2001) were redistributed through FWP and the Montana/Dakotas State Office of the BLM.

RESULTS

A total of twenty-two (22) occurrence reports with legal descriptions were compiled during the 2004 report period. No specimens were surrendered to FWP from incidental trapping, although at least six reports indicated that foxes were captured in coyote sets but apparently released and two others were reported as unrecovered road-kill mortalities. Nineteen reports

originated from six counties in northcentral Montana and three reports came from two counties south of the Blackfeet reservation in the westcentral portion of the state. Northcentral Montana counties include Blaine, Daniels, Hill, Petroleum, Phillips, and Valley counties, with the reports of swift fox present in Daniels and Petroleum providing new distribution data that would suggest population expansion to the east and south, respectively. Species occurrence reports from Lewis & Clark and Teton counties in westcentral Montana also provide new evidence that the reintroduced Blackfeet population is expanding southward into the state. Collection of these swift fox occurrence reports during 2004 will result in the addition of four new occupied counties to the current 1998-2003 range map produced by the Swift Fox Conservation Team (Figure 1).

The lead Canadian investigator for the 2000-01 international swift fox census received \$18,500 through FWP from BLM grant funds to be used for public conservation education regarding the Montana-Canada population, completion of scientific analysis of population demographic data, updating the 2000-01 swift fox census database, and using data from the 2000-01 census to develop a habitat suitability model using a GIS-based landscape analysis for the Montana-Canada population. The Montana/Dakotas State Office of the BLM provided approximately \$8,500 to the USGS Northern Prairie Wildlife Research Center to complete a national swift fox habitat suitability model.

DISCUSSION

Swift fox occurrence reports collected during the 2004 report period contributed additional evidence that resident swift fox populations continue to expand into unoccupied habitat in Montana. Of particular interest are the reports from Teton and Lewis & Clark counties that suggest the reintroduced Blackfeet population is quickly expanding through natural dispersal to recolonize vacant habitat up to 70 miles away. The Blackfeet Reservation is part of a large block of contiguous prairie along the east front of the Rocky Mountains that encompasses over 1.6 million acres of suitable habitat. Two of the three reports were verified with foxes in hand as one was captured in a coyote set and the other was a collected road-kill mortality (*as of April 2005 there is now a suspected natal den site in this location attended by two foxes*).

In northcentral Montana, swift fox continue to expand in distribution and increase in population size. Occurrence reports collected from this area indicate foxes are dispersing further to the east and to the south. The 2004 report from Petroleum County (and 1997 report in Garfield County) would suggest swift fox are crossing the Missouri River and Fort Peck Reservoir. A second international swift fox census of the Montana population, in conjunction with Canada, is scheduled for the winter of 2005-06 and this effort will provide current status information.

Available funds were distributed to support completion of two important efforts that will provide new information on population viability and habitat suitability of swift fox in their northern range and a national habitat suitability model. Information from both projects should allow managers to better describe and delineate remaining suitable prairie habitats within historical swift fox range and assess differences between occupied and unoccupied habitats.

Kahn, R., L. Fox, P. Horner, B. Giddings, and C. Roy. 1997. Conservation assessment and conservation strategy for swift fox in the United States. Montana Fish, Wildlife & Parks. Helena, MT. 54 pp.

Figure 1. Swift fox distribution in Montana by county, 1998-2004.

NEBRASKA SWIFT FOX REPORT, 2004

SAM WILSON, Nebraska Game and Parks Commission, 2200 North 33rd St., Lincoln, NE 68503. Tel: 402-471-5174; FAX: 402-471-5528; E-mail: sam.wilson@ngpc.ne.gov

Due to adverse weather and the Nongame Mammal/Furbearer Program Manager position being vacant for much of 2004, no swift fox related activities were conducted in 2004; however, scent station surveys will resume in 2005.

Swift fox are listed as state endangered in Nebraska, therefore they are considered a species in need of conservation in the Nebraska Natural Legacy Project.

SWIFT FOX RESEARCH IN NEW MEXICO: 2004 UPDATE

JAMES N. STUART, New Mexico Department of Game and Fish, Conservation Services
Division, PO Box 25112, Santa Fe, NM 87504. Tel: 505-476-8107; FAX: 505-476-8128;
E-mail: JStuart@state.nm.us

ABSTRACT

Swift fox (*Vulpes velox*) occur in shortgrass prairies in the eastern one-quarter of New Mexico and are still found in the majority of areas where they occurred historically. Studies of swift fox distribution, ecology, and survey techniques in New Mexico were initiated in 1999; several recent publications present the results of these studies. Since 2002, swift fox have been surveyed via scat collection on established road transects in 12 counties. Results of the most recent (2003) scat surveys are presented and discussed; scat surveys are also scheduled for 2005. Swift fox is a harvestable furbearer in New Mexico and recent harvest data are presented. At present, New Mexico does not have a pelt tagging requirement for swift fox. The species and its habitat are considered conservation priorities in the New Mexico Comprehensive Wildlife Conservation Strategy.

INTRODUCTION

The swift fox (*Vulpes velox*) inhabits shortgrass prairie communities in 12 counties of eastern New Mexico. The species presently occurs throughout its historic range in New Mexico with the exception of areas in eastern Curry and Roosevelt counties, which have been developed as cropland, and in southeastern Quay County where taller grass and shrub encroachment has replaced shortgrass prairie (Harrison and Schmitt 2003). The range of kit fox (*Vulpes macrotis*) overlaps with that of swift fox in southeastern New Mexico, and hybridization in this overlap zone suggests that the two species may be conspecific (Dragoo and Wayne 2003).

The NMDGF has funded and participated in ecological studies and monitoring of swift fox in New Mexico since 1999 (Harrison and Schmitt 2002). Recently published studies on swift fox include journal articles on survey techniques and distribution (Harrison et al. 2002, 2004); demography, movement, denning and diet (Harrison 2003b); and fleas and plague (Harrison et al. 2003). Ford et al. (2004) reviewed the ectoparasite fauna of New Mexico swift fox.

Monitoring of swift fox in New Mexico using scat surveys was implemented in 2002 under a contract with Robert Harrison. A standardized monitoring protocol was developed for NMDGF by Harrison (2003a) who adapted the methodology from surveys done the previous year (Harrison et al. 2004).

ACTIVITIES IN 2003-2004

During spring 2003, the NMDGF collected carnivore scats along 89 road transects in 12 counties of eastern New Mexico (Dragoo and Moore 2004; Enk 2005). A total of 27 person-days of effort was needed to survey the 89 transects in 2003. Ten additional transects identified by

Harrison (2003a) in his protocol were not surveyed.

Following the 2003 survey, NMDGF contracted with researchers at the University of New Mexico to analyze 522 carnivore scats (including 7 control scats of known identity) and identify them to species via amplification of a portion of the mitochondrial DNA cytochrome *b* gene (Dragoo and Moore 2004). Swift fox was confirmed in nine of the 12 counties and on 37 of the 89 transects surveyed. Of the 173 scats identifiable to species, 111 (64.2%) were swift fox; 349 scats (including 5 control scats) or 66.9% could not be identified to species. Other carnivore scats collected that were identifiable included those of striped skunk, coyote, badger, gray fox, kit fox, red fox, domestic dog, and domestic cat (in approximate order of prevalence).

The percentage of positive transects in the 2003 survey (37 of 89; 41.5 %) was lower than that in the 2002 survey (58 of 83; 69.9%). Although this decrease in positive transects could indicate a decline in swift fox numbers or loss of populations, other factors can affect survey results. These factors include the experience of the surveyors, time of year when surveys were done, condition of collected scats, handling and storage of scats, laboratory analysis procedures, etc. Several years of scat surveys will likely be needed to detect any change in swift fox distribution in the state.

FURBEARER HARVEST DATA

Swift fox is a protected furbearer that can be legally harvested in New Mexico. Varying numbers of swift fox are taken by trappers each year, often as incidental captures by coyote trappers. Harvest data collected in many recent years by NMDGF combined kit fox and swift fox (based on identifications reported by trappers). However it is usually possible to separate the harvest numbers for the two species based on the county in which foxes were reportedly taken. Harrison and Schmitt (2003) reviewed trapper harvest data and reported a peak estimated annual sport harvest of 962 in 1985-86. This decreased to an annual average of 19 during 1990-95 (Harrison and Schmitt 2003) and annual harvest remained low through the late 1990s (NMDGF unpublished harvest reports). From 2000 to 2004, the annual reported harvest has ranged from 2 to 48.

New Mexico does not require tagging of swift fox pelts. Based on the current level of take as reported by trappers, the NMDGF has decided not to implement pelt tagging at this time but will continue to evaluate the need for a tagging rule on an annual basis.

CURRENT AND FUTURE ACTIVITIES

The NMDGF will conduct scat surveys again in spring 2005 using the Harrison (2003a) protocol. Genetic analysis of scats will be completed by early 2006. We have tentatively scheduled scat surveys to be conducted every two years.

The NMDGF is presently developing a Comprehensive Wildlife Conservation Strategy (CWCS) for the state of New Mexico, which identifies and discusses species and habitats in greatest need of management and research funding. Swift fox has been included among the CWCS species of greatest conservation need. Prairie habitats used by swift fox (Western Great

Plains Shortgrass Prairie and, to a lesser extent, Western Great Plains Sand-sage Shrubland) in eastern New Mexico are among the identified CWCS priority habitats.

LITERATURE CITED

- Dragoo, J.W. and K.A. Moore. 2004. Swift fox scat identification. Final report to New Mexico Department of Game and Fish, Santa Fe.
- Dragoo, J.W. and R.K. Wayne. 2003. Systematics and population genetics of swift and kit foxes. Pp. 207-221 in M.A. Sovada and L. Carbyn (eds.), *The Swift Fox: Ecology and Conservation of Swift Foxes in a Changing World*. Canadian Plains Research Center, University of Regina, Regina, Saskatchewan, Canada.
- Enk, T. 2005. 2003 New Mexico swift fox completion report. Pg. 35 in Grenier, M. and H. Whitlaw (eds.), *Swift Fox Conservation Team 2003 Annual Report*. Wyoming Game and Fish Department, Lander, WY.
- Ford, P.L., R.A. Fagerlund, D.W. Duszynski, and P.J. Polechla. 2004. Fleas and lice of mammals in New Mexico. USDA Forest Service RMRS-GTR-123.
- Harrison, R.L. 2003a. Population monitoring protocol for swift fox in New Mexico. Unpublished report to New Mexico Department of Game and Fish, Santa Fe.
- Harrison, R.L. 2003b. Swift fox demography, movements, denning, and diet in New Mexico. *Southwestern Naturalist* 48:261-273.
- Harrison, R.L., D.J. Barr, and J.W. Dragoo. 2002. A comparison of population survey techniques for swift foxes (*Vulpes velox*) in New Mexico. *American Midland Naturalist* 148:320-337.
- Harrison, R.L., P.S. Clarke, and C.M. Clarke. 2004. Indexing swift fox populations in New Mexico using scats. *American Midland Naturalist* 151:42-49.
- Harrison, R.L., M.J. Patrick, and C.G. Schmitt. 2003. Foxes, fleas, and plague in New Mexico. *Southwestern Naturalist* 48:720-722.
- Harrison, R.L. and C.G. Schmitt. 2002. Final report of investigations of swift fox survey methods, demography, and ecology in New Mexico. Pp. 57-75 in M. Peek (ed.), *Swift Fox Conservation Team Annual Report, 2001*. Kansas Department of Wildlife and Parks.
- Harrison, R.L. and C.G. Schmitt. 2003. Current swift fox distribution and habitat selection within areas of historical occurrence in New Mexico. Pp. 71-77 in M.A. Sovada and L. Carbyn (eds.), *The Swift Fox: Ecology and Conservation of Swift Foxes in a Changing World*. Canadian Plains Research Center, University of Regina, Regina, Saskatchewan, Canada.

NORTH DAKOTA SWIFT FOX ANNUAL REPORT, 2004

JACQUIE R. ERMER,* North Dakota Game and Fish Department, 406 Dakota Ave., Riverdale, ND 58565.

* No longer with NDGFD.

Swift fox track surveys are conducted every 3 years in North Dakota and 2004 was not a scheduled year. During 2004, no incidental observations or incidental catches of swift fox were reported in North Dakota.

In 2004, the North Dakota Game and Fish Department included the swift fox on the state's list of Species of Conservation Priority, which is an integral part of the State Wildlife Grant Program. Management and conservation plans for swift fox will be included in the final conservation plan required for the program.

SWIFT FOX INVESTIGATIONS IN OKLAHOMA, 2004

JULIANNE WHITAKER HOAGLAND, Oklahoma Department of Wildlife Conservation, 1801 N. Lincoln Blvd., Oklahoma City, OK 73105. Tel: 405-522-0189; FAX: 405-521-6535; E-mail: jhoagland@odwc.state.ok.us

ABSTRACT

Baseline swift fox (*Vulpes velox*) distribution data were collected over a three-year period, 1998 - 2000, by using a track search survey. Habitat associated with track locations was examined in 2001-02. Results of these investigations have been reported in previous Swift Fox Conservation Team Annual Reports. In 2004, the track search survey was repeated to evaluate the current status of the swift fox in the shortgrass High Plains region. Also, Oklahoma State University began a study in 2003 to look at abundance and habitat associations of the swift fox in the Oklahoma panhandle. Data analyses from these studies are currently underway and complete results will be published in the 2005 report.

INTRODUCTION

In Oklahoma, The swift fox (*Vulpes velox*) is designated as a species of greatest conservation need. Historically, the swift fox was considered to occur throughout the shortgrass High Plains region of Oklahoma, including all or portions of Cimarron, Texas, Beaver, Harper, Woodward and Ellis counties (Caire et al. 1989, Duck and Fletcher 1945, Hoagland 2002a). Swift foxes were observed in Texas and Beaver counties during the 1950s and 1960s by several researchers (Cutter 1959, Glass 1959, Kilgore 1969). A 1988 landowner survey conducted by the Oklahoma Department of Wildlife Conservation (ODWC) produced 21 swift fox sightings and eight den locations in the panhandle region (Kocka 1989). Additionally, five verified swift fox sightings by ODWC biologists were reported from Cimarron, Texas, Beaver and Roger Mills counties (Hoagland 1996) between 1988 and 1994. Optimal swift fox habitat (shortgrass prairie with relatively level terrain) occurs primarily in the western two-thirds of the Oklahoma panhandle. Increasing topography and taller, denser mixed grass vegetation replaces the blue gramma/buffalo shortgrass community as one moves west to east across the swift fox's range in Oklahoma.

SUMMARY OF PROGRESS

The objectives of this project were to establish a track search survey in order to, develop baseline swift fox distribution and abundance information throughout the shortgrass High Plains region in Oklahoma, and develop a technique that could be used to monitor population trends of swift foxes over time. The survey was repeated in the summer of 2004 in 102 townships across the shortgrass High Plains region to determine the current status of the swift fox in the region, and how effective the survey is at monitoring swift fox populations over time. The survey was conducted in portions of six counties (Cimarron, Texas, Beaver, Harper, and Ellis, and Woodward) in order to investigate the species' current distribution within its historical range. Tracks were found in 35 of the 57 townships surveyed in 1998, 43 of 114 townships surveyed in 1999, and in 36 of 101 townships surveyed in 2000. In 2004, swift fox tracks were found in 57

out of 102 townships surveyed (Figure 1). During the 2004 survey, swift fox tracks were detected for the first time in three townships in Harper County and one township in Ellis County (Figure 1).

In Cimarron and Texas counties, where data are available for all four years, the number of townships where swift fox tracks were detected declined from 35 townships in 1998 to 24 townships in 1999 and 21 townships in 2000 (Table 1). The number of townships with swift fox tracks recorded rose in 2004 to 44 (Table 1). The average time it took to detect swift fox tracks, if they were found, however fluctuated only slightly among years, ranging from 39 minutes in 1998 to 46 minutes in 1999 (Table 1). The number of townships where swift fox tracks were observed within the first 30 minutes also fluctuated from a high of 17 in 1998 and 2004 to a low of 5 in 1999 (Table 1). Swift fox tracks were not found more than one time within the first 30 minutes in any township during 1999, compared to seven townships where more than one set of swift fox tracks was observed in 1998, six townships in 2004, and two townships in 2000 (Table 1).

Comparing track results across the shortgrass High Plains region, 2004 yielded the greatest proportion of townships with swift fox tracks detected (56%, n=57), while 2000 had the lowest proportion (32%, n=35) (Table 2). The average time to first track, however, was nearly the same for all three years for which complete data were available, range 42 to 49 minutes (Table 2). Year 2004 did show a greater number of townships with tracks found within the first 30 minutes of survey time and townships with more than one set of swift fox tracks found within the first 30 minutes (Table 2).

Table 1. Comparison of swift fox track detection statistics in Cimarron and Texas counties from 1998 to 2004.

Swift Fox Tracking Variables Recorded	1998	1999	2000	2004
Townships surveyed	57	57	57	57
Townships with swift fox tracks	35	24	21	44
Average time to first track in minutes	39	46	41	45
Townships with tracks observed within first 30 minutes	17	5	11	17
Townships with >1 set of swift fox tracks observed	7	0	2	6

Table 2. Comparison of swift fox track detection variables throughout the shortgrass High Plains region for years 1999, 2000 and 2004.

Swift Fox Tracking Variables Recorded	1999	2000	2004
Townships Surveyed	114	109	102
Townships with swift fox tracks (% of total)	43 (38%)	35 (32%)	57 (56%)
Average time to first track in minutes	49	43	42
Townships with tracks observed within first 30 minutes	14	19	30
Townships with >1 set of swift fox tracks observed	3	2	13

During 1998, 42% of sites where swift fox tracks were observed in Cimarron and Texas counties had soil tracking conditions that were considered good to excellent, while in 1999, this percentage dropped to 34% (Table 3). The summer of 2000 was an extreme drought year and this percentage dropped to 8%, while the summer of 2004 was abnormally wet and cool and this percentage rose to 35% (Table 3). The percentage of surveys conducted within one to three days following a rainfall event also dropped from 74% in 1998 to 51% in 1999 to 5% in 2000, but increased to 33% in 2004 (Table 3). And the percentage of surveys conducted more than seven days following a rainfall increased from 7% to 17% to 82% between 1998 and 2000, but declined again to 30% in 2004 (Table 3). The percentage of track search surveys conducted while winds were between one and five miles per hour fluctuated between a low of 30% in 2004 to a high of 68% in 1998 (Table 3). While the percentage of surveys conducted when wind speeds were greater than 15 miles per hour ranged from 0% in 1998 to 10% in 2004 (Table 3).

Comparing track search survey results among years across the whole shortgrass High Plains region for which complete data were available, indicated also that environmental conditions play an important part in swift fox track detection rates (Table 4). For all years, the percentage of track sites with good to excellent tracking conditions increased as the percentage of surveys conducted within one to three days of a rain event increased (Table 4). Likewise, the greater the percentage of surveys conducted more than seven days following a rain event, the lower the percentage of sites with good to excellent tracking conditions (Table 4). Wind appears to have no affect on tracking conditions (Table 4). Because the majority of track search surveys were conducted during morning hours, the percentage of surveys conducted with winds greater than 15 miles per hour was very low.

Table 3. Soil tracking conditions, days since last rain, and wind conditions recorded during swift fox surveys in Cimarron and Texas counties from 1998 to 2004.

Environmental Conditions	1998	1999	2000	2004
Percentage of sites with good to excellent tracking conditions	42%	34%	8%	34%
Percentage of surveys conducted within 1 to 3 days of a rain event	74%	51%	5%	33%
Percentage of surveys conducted > 7 days following a rain event	7%	17%	82%	30%
Percentage of surveys conducted with winds 1 to 5 mph	68%	44%	53%	30%
Percentage of surveys conducted with winds > 15 mph	0%	5%	5%	10%

Table 4. Soil tracking conditions, days since last rain, and wind conditions recorded during swift fox surveys throughout the shortgrass High Plains from 1999 to 2004.

Environmental Conditions	1999	2000	2004
Percentage of sites with good to excellent tracking conditions	39%	24%	40%
Percentage of surveys conducted within 1 to 3 days of a rain event	54%	8%	34%
Percentage of surveys conducted > 7 days following a rain event	21%	65%	30%
Percentage of surveys conducted with winds 1 to 5 mph	48%	59%	41%
Percentage of surveys conducted with winds >15 mph	6%	11%	6%

The summer of 2004 proved to be unique climatologically, with a very dry May followed by a very wet June, and average precipitation in July and August (Schneider and Garbrecht 2004). After a couple of dry months, June, 2004 was marked by above normal precipitation in the southern High Plains. Rain totals for June across the swift fox range in Oklahoma ranged from 3 inches to 8 inches, with 4 to 5 inch totals across 50% of the shortgrass High Plains (Schmidt and Lawrence 2005). Cool and wet weather prevailed across the Oklahoma Panhandle during July. Several record low and minimum high temperatures were broken across Oklahoma and north Texas. August was the third month in a row in which cool and wet conditions were prominent. Throughout the shortgrass swift fox range, 2 to 6 inches of rain fell in July and 1.5 to 8 inches in August, 2004 (Schmidt and Lawrence 2005).

The project initiated by Oklahoma State University (OSU) in 2003 to look at abundance and habitat associations of the swift fox in Oklahoma was completed in December 2004. Objectives of the OSU study are: to estimate density of swift foxes throughout the Oklahoma Panhandle; to develop quantitative relationships between density estimates and indices of relative abundance; and to assess habitat suitability for swift fox by linking density estimates and survey results to landscape and habitat characteristics with GIS analyses. Field work began during the summer 2003 and continued through December, 2004. The project's Final Report, however, won't be available until after the completion of this write up. Results will be provided in next year's summary.

LITERATURE CITED

- Caire, W., J. D. Tyler, B. P. Glass, and M. A. Mares. 1989. Mammals of Oklahoma. University of Oklahoma Press, Norman, OK. 567 pp.
- Cutter, W. J. 1959. Notes on some mammals from north Texas. Southwestern Nat. 4:30-34.
- Duck, L. G. and J. B. Fletcher. 1945. A survey of the game and furbearing animals of Oklahoma. Div. Wildl. Restor. and Res., Oklahoma Game and Fish Comm., Pitman-Robertson Ser. No. 2, State Bull. No. 3. Oklahoma City.
- Glass, B. P. 1959. Status of the kit fox, *Vulpes velox*, in the High Plains. Proc. Oklahoma Acad. Sci. 37:162-163.
- Hoagland, J. W. 1996. Oklahoma swift fox status report - 1996. Pages 30-49 in Luce, B. and F. Lindzey (eds.) Annual Report of the Swift Fox Conservation Team. 110 pp.
- Hoagland, J. W. 2002a. Population distribution of swift fox in northwestern Oklahoma using a track search survey. Final Report. Oklahoma Department of Wildlife Conservation. Federal Aid Project E-49. Oklahoma City.
- Kilgore, D. L., Jr. 1969. An ecological study of the swift fox (*Vulpes velox*) in the Oklahoma Panhandle. Amer. Midl. Nat. 81:512-534.
- Kocka, D. M. 1989. Furbearer distribution and population trends. OK Dept. Wildl. Conserv. Performance Report W-82-R-28, Study 3, Job 1. 6 pp.
- Schmidt, J. and B. Lawrence. 2005. Gridded Percent-of-Normal Precipitation Mapping for the Arkansas and Red River Basins. National Weather Service NOAA Precipitation Analysis. srh.noaa.gov.
- Schneider, J.M. and J.D. Garbrecht. 2004. Oklahoma Summer 2004-How Unusual Was It? In: Proceedings of the Oklahoma Water 2004 Conference, November 18-19, 2004, Stillwater, Oklahoma.

Oklahoma

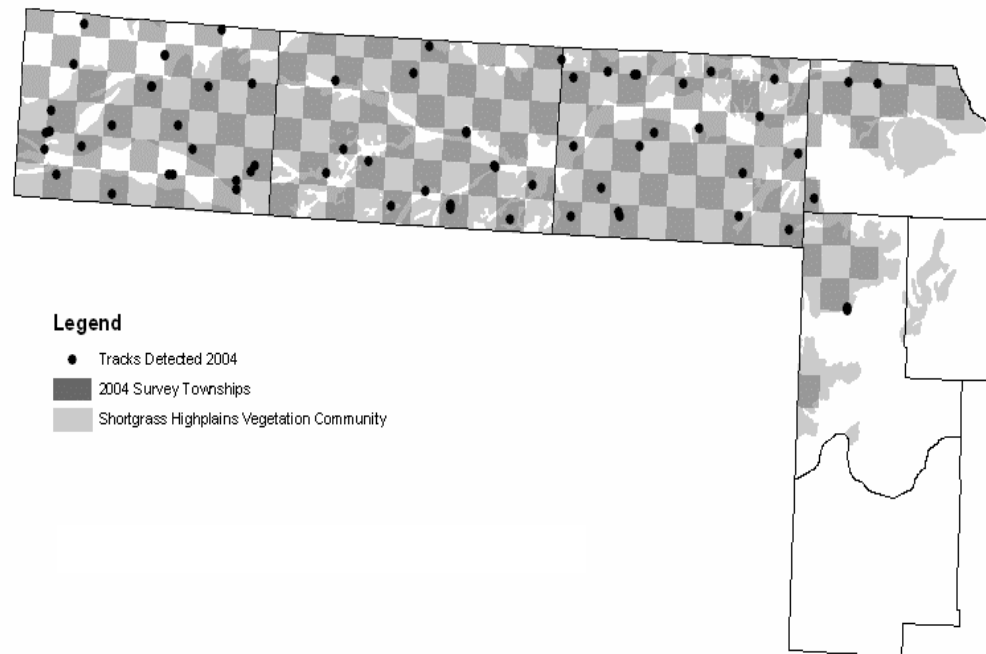


Figure 1. Townships surveyed and swift fox tracks detected in 2004

SOUTH DAKOTA SWIFT FOX REPORT, 2004

EILEEN DOWD STUKEL, South Dakota Department of Game, Fish and Parks, 523 East Capitol, Pierre, SD 57501. Tel: 605-773-4229; FAX: 605-773-6245; E-mail: eileen.dowdstukel@state.sd.us

Because of South Dakota's limited swift fox population, the South Dakota Department of Game, Fish and Parks (SDGFP) has primarily focussed survey efforts on the swift fox population found on federal and private lands in southwestern South Dakota. This effort will continue with additional fieldwork in 2005. SDGFP has also attempted to verify reports of swift fox sighted during black-footed ferret spotlighting efforts and sightings reported from Shannon County. Much of the survey work has been conducted under contract to the Wildlife and Fisheries Sciences Department, South Dakota State University. Results have been presented in the appropriate Swift Fox Conservation Team annual reports and at scientific venues.

SDGFP has included the swift fox as a "species of greatest conservation need" in its Comprehensive Wildlife Conservation Plan. The agency has assisted with permit issues related to two swift fox reintroduction projects currently underway in the state. SDGFP has recently submitted a project for State Wildlife Grants in cooperation with the Turner Endangered Species Fund related to swift fox reintroduction on Bad River Ranches in central South Dakota

TEXAS SWIFT FOX REPORT 2004

HEATHER WHITLAW, Texas Parks and Wildlife Department, Box 42125 TTU,
Lubbock, TX 79409-2125. Tel: 806-742-6888, ext. 242; FAX: 806-742-2280; E-
mail: heather.whitlaw@tpwd.state.tx.us

CURRENT PROJECTS

We have initiated a project to determine swift fox distribution in Texas, in addition to evaluating the influence of habitat fragmentation on swift fox distribution, habitat utilization, and genetic diversity in the state. This research is being conducted by Ms. Donelle Schwalm (previously with Turner Endangered Species Fund swift fox project), under the supervision of Dr. Warren Ballard, Dr. Ernest Fish, and Dr. Robert Baker of Texas Tech University. The primary objectives of this study are to identify available swift fox habitat in Texas and determine current distribution, identify factors influencing patch occupancy, identify genetic patterns exhibited within the study area, and identify factors influencing regional genetic diversity of swift fox.

*For a more detailed description of this project and its objectives, see Schwalm et al. (2005, this volume, pp. 69-72).

COMPLETED RESEARCH

In February 2005, Dr. Brady McGee successfully defended his dissertation on the importance of artificial escape cover for increasing swift fox populations in northwest Texas. In November 2004, Ms. Kerry Nicholson successfully defended her thesis on swift fox occurrence in black-tailed prairie dog towns in the northwest Texas panhandle. Both documents are available by request, in addition to current publications resulting from research, by emailing Heather Whitlaw (heather.whitlaw@tpwd.state.tx.us) or Dr. Warren Ballard (warren.ballard@ttu.edu). For summaries of these research projects, see McGee et al. (2005, this volume, pg. 73) and Nicholson et al. (2005, this volume, pg. 74).

WYOMING SWIFT FOX COMPLETION REPORT (15 April 2004 – 14 April 2005)

MARTIN GRENIER, Nongame Mammal Biologist; LAURIE VAN FLEET, Nongame Biologist; ROB STEPHENS, Grassland Ecologist; TODD FILIPI, Nongame Seasonal Biologist; DANIEL WEBBER, Nongame Seasonal Biologist, Wyoming Game and Fish Department, 260 Buena Vista, Lander, WY 82520. Tel: 307-332-2688, ext. 230; FAX: 307-332-6669; E-mail: martin.grenier@wgf.state.wy.us

INTRODUCTION

Recent Wyoming survey efforts for swift fox (*Vulpes velox*) have focused on conducting trend surveys using known swift fox locations across the state (Grenier and Van Fleet 2005). The surveys followed a protocol developed by Olson et al. (1999). Although baseline trends have been established in many portions of the state, swift fox distribution has not been addressed during this time. The Conservation Assessment and Conservation Strategy for the Swift Fox in the United States (Kahn et al. 1997) states that swift fox distribution be monitored/revisited every 5 years; the next revision of the range-wide distribution map by the Swift Fox Conservation Team (SFCT) is scheduled for 2006. The SFCT plans to use recent detections of swift fox, if they occur, within counties historically occupied by swift fox to generate the range-wide distribution map and monitor occupancy across the range of the species. The Wyoming Game and Fish Department (WGFD) and the SFCT have determined that recent records of several historic swift fox detections in some counties are lacking, including in Wyoming. The WGFD and the SFCT believe that swift fox are still present in these areas; however data is lacking. In Wyoming, Sheridan, Johnson, Weston and Crook counties are lacking recent records.

Moreover, distribution records of swift fox in many Wyoming counties need to be revised and additional records are needed. According to Woolley et al. (1995), the current population occurs primarily in three geographic regions: Region 1) Laramie Valley and Shirley Basin in Albany and Carbon counties; Region 2) Southeastern Plains – parts of Laramie, Platte, and Goshen counties; and Region 3) Powder River Basin - parts of Converse, Natrona, Weston, and Niobrara counties. Many townships of these counties have not been surveyed to document swift fox presence or absence. Therefore, future survey efforts for swift fox will aimed at revising and improving distribution data for the swift fox in Wyoming.

METHODS

Track plates were made of 16-gauge sheet steel, measured 61 cm x 61 cm (2 ft x 2 ft) painted with two coats each of gray primer and gray paint. A 1-gallon weed sprayer was used to coat the plates with talc/carpenter's chalk and ethyl alcohol mixture; the ratio used was 1 cup of talc powder to 1.5 cups of carpenter's chalk per 1 gallon 95% ethyl alcohol. This mixture will prepare 40-50 track plates. Approximately 15 g (0.5 oz) of stirred jack mackerel were placed in the center of the plate as an attractant. Plates were spaced 0.8 km (0.5 mi) apart within public road easements where tracks could be observed without requiring private land access. Track plates were placed along an existing fence if one was present. When a fence was not present, plates were placed 10 to 25 m (33 to 82 ft) from the centerline of the road.

Flagging marked locations of plates and a GPS location in UTM coordinates were recorded for all track plates in each transect. Transects were observed for a maximum of six days, but monitoring ceased the day after swift fox presence was confirmed. During periods of heavy rain and snow plates were left in place for up to two additional nights. If rain or snow persisted for more than two nights, the survey effort was abandoned and postponed until favorable weather conditions returned.

Tracks of swift fox were identified utilizing Grenier et al. (2003), recorded, and lifted for future reference and measurements with 2-inch clear packing tape. In some cases, clear contact paper was used to preserve an entire track plate for future use in identifying tracks. Plates were cleaned with a stiff brush or steel wool before reuse.

All townships with swift fox detections prior to 2004 were identified within Albany and Carbon counties using data from the WGFD Wildlife Observation System (Figure 1). Every other township without confirmed swift fox detection prior to 2004 within suitable habitat was selected for survey (Figure 2).

RESULTS

Twenty-eight townships in Albany (20) and Carbon County (8) had swift fox detections prior to 2004 (Figure 1). Track plate survey effort for Albany and Carbon Counties are presented in Table 1. A completed survey resulted after either a swift fox was detected or when a transect was run for 6 consecutive nights without a swift fox detection. Incomplete surveys resulted from an inability to run a transect for the entire 6 nights. A total of 41 transects were attempted of which 26 (70%) were completed. The remaining 11 (30 %) were not completed due to poor weather conditions, for example multiple nights with rain. Seven-hundred twenty track plates nights were utilized during the surveys of which 445 (62%) were associated with completed surveys. Fifty-two miles (70%) of public roads in Albany and Carbon Counties were associated completed surveyed.

Swift fox detection results are presented in Table 2. Twenty-six townships had completed surveys (Figure 3). Seventeen of the 26 (65%) townships with completed surveys had swift fox detections (Figure 4). An average of 5.5 survey nights was needed to detect a swift fox in Albany County, whereas only 4.6 survey nights was needed in Carbon County. Track plate nights per swift fox detection was 27.5 in Albany and 23 in Carbon County. All swift fox detections for Albany and Carbon Counties are presented in Figure 5. Approximately 4 townships were not surveyed due to lack of public access; as such, adjoining townships were selected as replacements.

Non-target detections in Albany county totaled 19 (Table 3). Coyote (*Canis latrans*), domestic cat (*Felis catus*), striped skunk (*Mephitis mephitis*), and red fox (*Vulpes vulpes*) were the most commonly detected non-target species. Non-target detections in Carbon County totaled 5 (Table 3). Only coyote and domestic dog (*Canis familiaris*) were detected.

An additional 5 townships were attempted in Laramie County in 2004; however, poor weather conditions precluded the completion of these surveys and will not be reported. Surveys attempted in Laramie County will be rescheduled in the future.

DISCUSSION

The distribution surveys in 2004 increased known swift fox locations in Albany County significantly and only slightly in Carbon County. This is correlated to both survey effort and weather conditions. Albany County was surveyed intensively in 2004 during good weather conditions while the surveys in Carbon County occurred near the Albany County line in fair to poor weather conditions.

Swift fox were the most commonly detected species in 2004 in Carbon and Albany Counties. This is similar to previous surveys conducted in Region 1 (Grenier and Van Fleet 2005). Swift fox in Albany and Carbon Counties may be easier to detect than in other regions of the state because these counties are primarily made up of public lands, which makes them easier to survey, and the habitat remains contiguous throughout the region. Large patches of swift fox habitat occur primarily on private lands in eastern Wyoming and are more difficult to survey. However, trap success from the Turner Endangered Species Fund translocation effort indicate that although swift fox may be more difficult to detect in eastern Wyoming they are likely as abundant as in Albany and Carbon County.

Survey efforts in 2005 will target Sheridan, Johnson, Weston and Crook Counties in order to assist the SFCT with the range map revision. The last record of swift fox in Crook County was reported in 1970 while the last Weston County record of swift fox was reported in 1996. The lack of recent < 5yrs of swift fox in these counties does not indicate that the species has been extirpated from the area. Recent records from Montana, just north of the Crook County border exist within the last 5 years. Lack of records in these areas in Wyoming simply indicates a lack of survey effort at this time.

LITERATURE CITED

- Grenier, M. B. and L. Van Fleet. 2005. Swift fox in Wyoming completion report. Pages 134-143 in A. O. Cerovski, editor. Threatened, Endangered, and Nongame Bird and Mammal Investigations. Wyoming Game and Fish Department Nongame Program, Biological Services Section, Cheyenne.
- Grenier, M., L. Van Fleet, M. Martin, and M. Purcell. 2003. Swift fox completion report. Pages 124-135 in A. O. Cerovski, editor. Threatened, Endangered, and Nongame Bird and Mammal Investigations. Wyoming Game and Fish Department Nongame Program, Biological Services Section, Cheyenne.
- Kahn, R., L. Fox, P. Horner, B. Giddings, and C. Roy, editors. 1997. Conservation assessment and conservation strategy for swift fox in the United States. Colorado Division of Wildlife, Ft. Collins, Colorado.
- Olson, T. L., F. G. Lindzey, and J. S. Dieni. 1999. A proposed protocol for monitoring swift fox in Wyoming. Unpublished manuscript. Wyoming Cooperative Fish and Wildlife Research Unit, Laramie.

Table 1. Track plate survey effort for Albany and Carbon Counties, Wyoming, 2004.

County	Total # Transects Run	Total # Track Plates	Ave # of Plates/ Transect	Total # Nights Run	Total # of Track Plate Nights	Total Miles of Transects
Albany	21	105	5	66	330	42
Carbon	5	25	5	23	115	10
	26	130	5	89	445	52
Albany*	6	30	5	40	200	12
Carbon*	5	25	5	15	75	10
	11	55	5	55	275	22

* - Incomplete surveys due to weather.

Table 2. Swift fox detections for Albany and Carbon Counties, Wyoming, 2004.

County	# of Transects Run	SF Detections	# Nights Run	Total TP Nights	TPN/ Swift Fox Detection
Albany	21	12	66	330	27.5
Carbon	5	5	23	115	23
	25	17	89	445	25.25
Albany*	6	0	40	200	0
Carbon*	5	0	15	75	0
	11	0	55	275	N/A

* - Incomplete surveys due to weather.

Table 3. Non-target detections on completed surveys for Albany and Carbon Counties, Wyoming, 2004.

County	CALA	FECA	CAFA	PRLO	MEME	VUVU	TATA
Albany	4	4		1	4	4	2
Carbon	5		1				

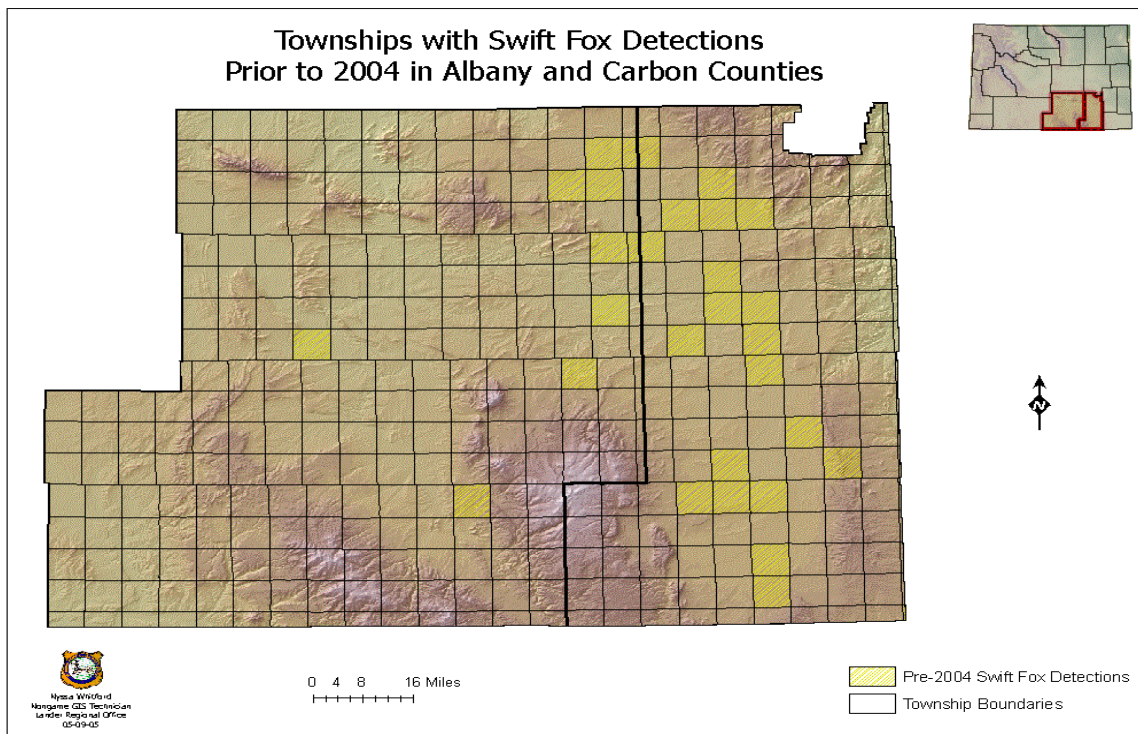


Figure 1. Townships with swift fox detections prior to 2004 in Albany and Carbon Counties, Wyoming.

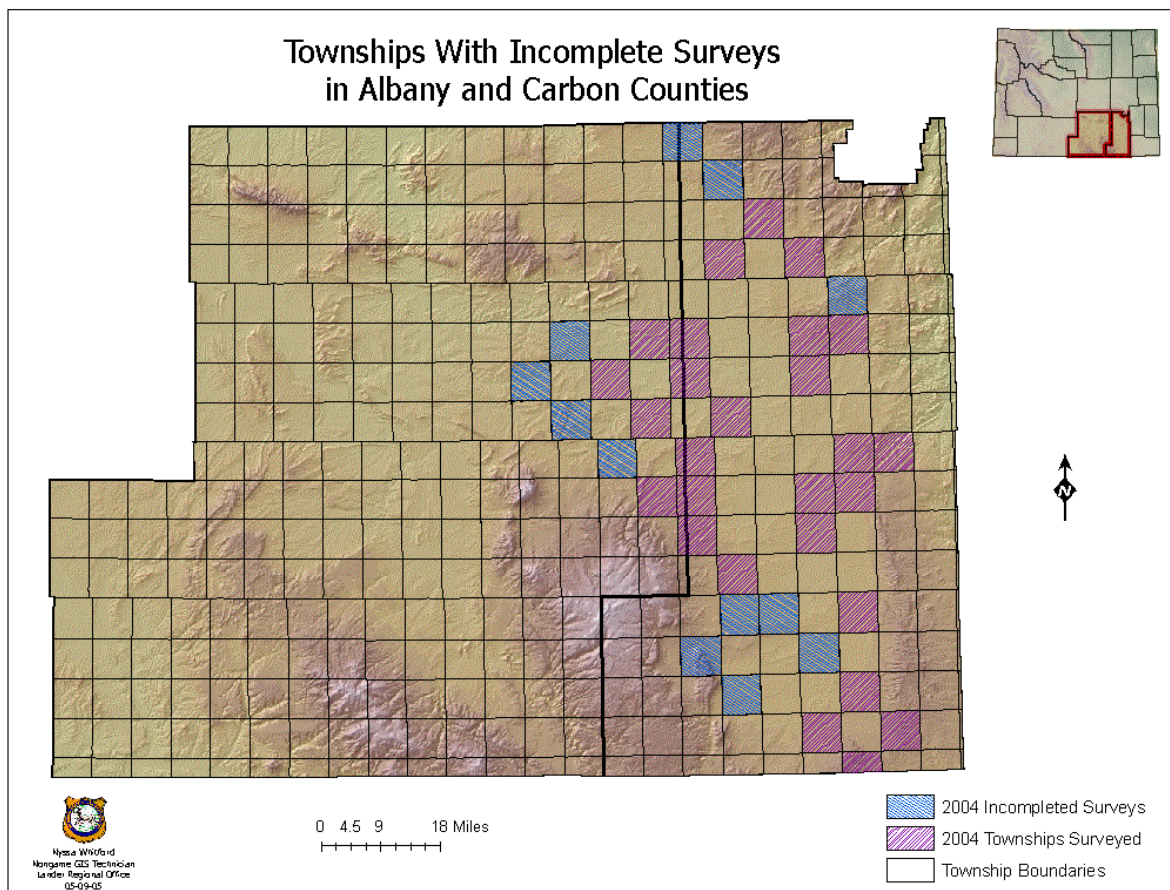


Figure 2. Townships planned for survey in Albany and Carbon County, Wyoming in 2004.

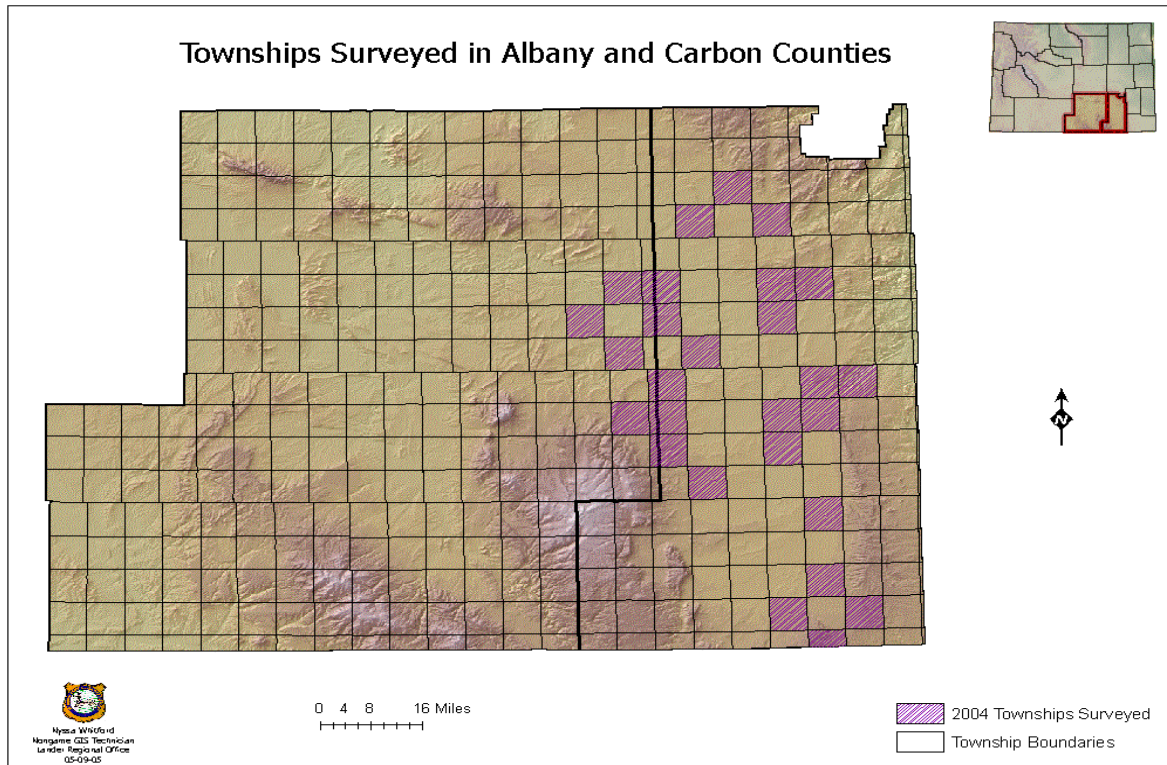


Figure 3. Townships with completed surveys in Albany and Carbon Counties, Wyoming 2004

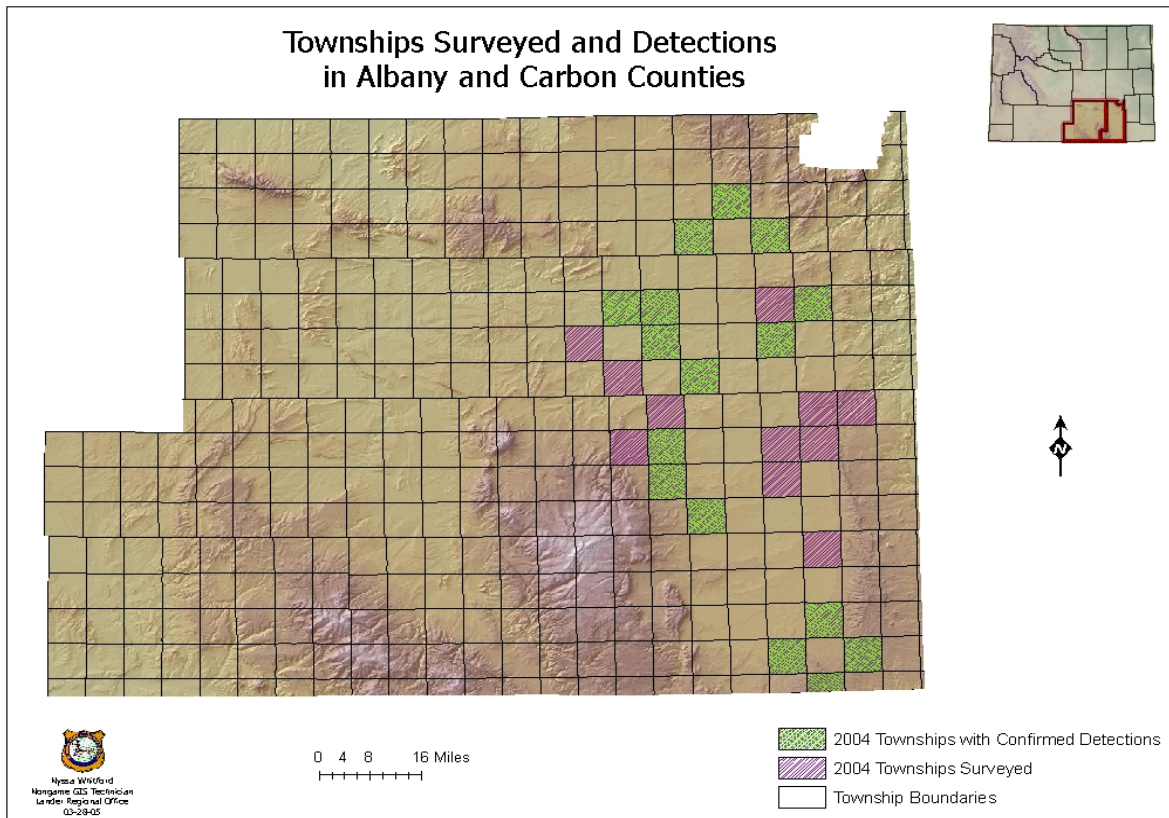


Figure 4. Townships with confirmed swift fox detections in Albany and Carbon Counties, Wyoming in 2004.

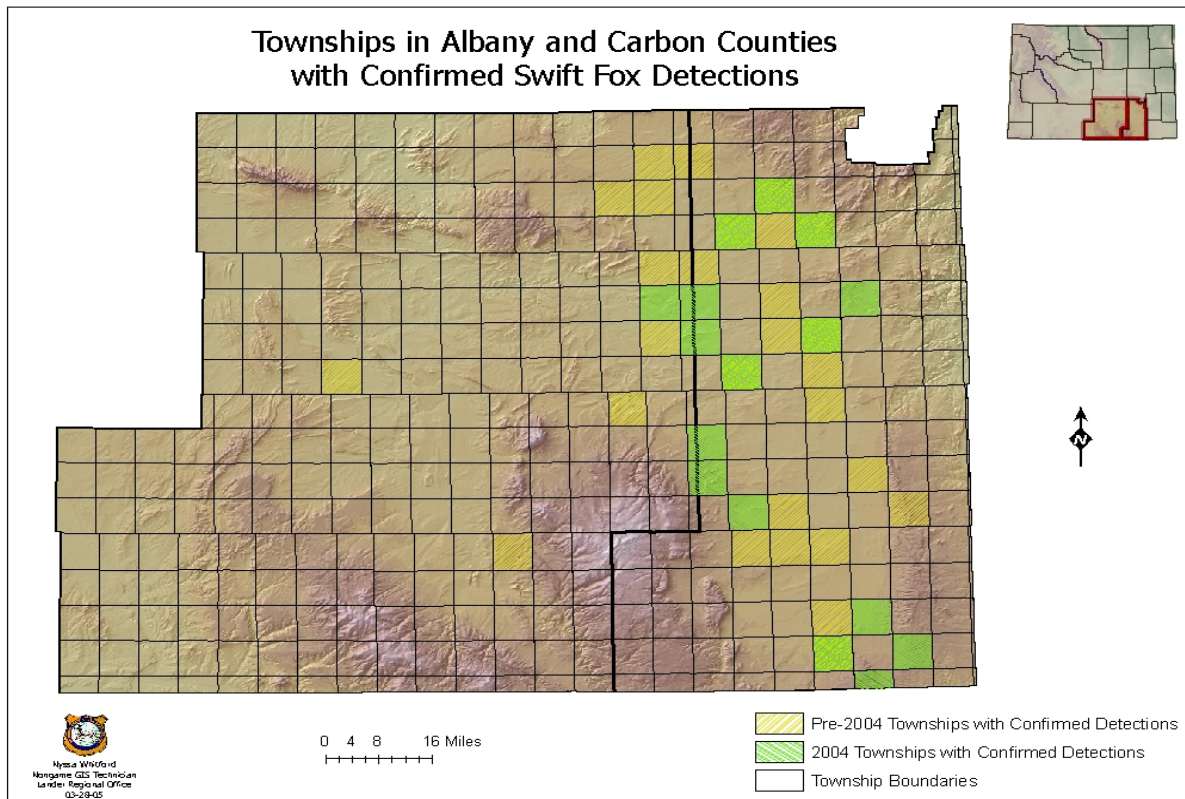


Figure 5. All townships with confirmed swift fox detections in Albany and Carbon Counties, Wyoming.

**REPORT OF APHIS WILDLIFE SERVICES:
NONTARGET TAKE OF SWIFT FOX AND KIT FOX IN 2004**

JEFF GREEN, APHIS Wildlife Services, Western Regional Office, 2150 Centre Ave., Bldg. B,
Mail Stop 3W9, Fort Collins, CO 80526. Tel: 970-494-7453; FAX: 970-494-7455; E-
mail: jeffrey.s.green@aphis.usda.gov

Swift fox and kit fox are not targets of any Wildlife Services wildlife damage management activities. However, some individual foxes are inadvertently taken during the course of operational activities as noted in Table 1. The distinction between swift fox and kit fox is made using established range distribution maps.

Table 1. Nontarget take by APHIS Wildlife Services of swift fox and kit fox in nine western states during 2004.

SWIFT FOX				KIT FOX		
State	Number	Method	Disposition	Number	Method	Disposition
CO	1	Leghold trap	Released	-	-	-
KS	0	-	-	-	-	-
MT	0	-	-	-	-	-
NE	0	-	-	-	-	-
ND	0	-	-	-	-	-
NM	1	Trap	Released	3	Trap	Released
"	8	M44	Killed	22	M44	Killed
"	-	-	-	2	Neck snare	Killed
OK	5	M44	Killed	-	-	-
TX	0	-	-	2	Trap	Killed
"	-	-	-	5	Neck snare	Killed
WY	1	Trap	Killed	-	-	-
"	1	M44	Killed	-	-	-
"	1	Neck snare	Killed	-	-	-
TOTAL	18			34		

SWIFT FOX IN NATIONAL PARK SERVICE UNITS

DAN LICHT, Wildlife Biologist, National Park Service, Midwest Region, 13000 Highway 244, Keystone, SD 57751. Tel: 605-574-5266; FAX: 605-574-2173; E-mail: dan_licht@nps.gov

With the exception of Badlands National Park (see below), swift fox continue to be absent or rare transients in National Park Service (NPS) units. Most NPS units in the Great Plains are small and/or not suitable habitat for swift fox. Reports of swift fox are occasionally received, but most remain unconfirmed. The recent authorization and proposed expansion of the Sand Creek Massacre National Historic Site in Kiowa County in southeast Colorado may someday support a few resident swift fox. The NPS currently owns only 900 acres at the site, but when fully acquired the unit will consist of 12,500 acres.

The National Park Service is currently completing an ambitious inventory of vertebrates and vascular plants in NPS units. Most of the field surveys have been completed and the agency is now compiling and certifying the data into a national database known as NPSpecies. As of April of 2005, 12 NPS units had reports (either references or observations) of swift fox in the units; however, with the exception of Badlands NP it is likely that most of these reports are spurious, historical, or of transient animals. The validity of these reports and the current status of swift fox in the park units will undergo a review by experts over the next few years.

Badlands National Park

The following is synthesized from an annual report prepared by Marsh Sovada (USGS-Biological Resources Division), Brian Kenner (Badlands National Park), Jonathan Jenks (South Dakota State University), and Greg Schroeder (Badlands National Park and South Dakota State University). Please contact them for more information.

Introduction

Swift foxes are part of the heritage of Badlands National Park (hereafter Badlands), and likely were very common prior to the early 1900s, but swift foxes were considered extirpated from the park by the mid-1900s. In 2001, the NPS and South Dakota Department of Game, Fish and Parks co-hosted the annual SFCT meeting, which included a tour of Badlands. This gathering of swift fox experts evaluated the area's potential for a successful swift fox reintroduction. Members of the SFCT unanimously agreed that the Badlands/Buffalo Gap National Grassland (BGNG) ecosystem possessed excellent potential swift fox and could support a self-sustaining population. It was agreed that one of the most immediate ways to provide recovery of swift fox populations in the northern reaches of their historic range is through reintroduction of foxes. The Badlands reintroduction is one of several in an effort to restore swift fox to the northern portion of their historic range. Turner Endangered Species Fund began a swift fox reintroduction program in 2002 on the Bad River Ranch (BRR) in South Dakota, owned by R.E. "Ted" Turner. BRR encompasses 570 km² and is located 50 miles northeast of Badlands.

Project Goals and Objectives

Our overall goal is to restore a viable swift fox population into Badlands/BGNG prairie ecosystem. USGS is serving in an advisory role to a graduate student and assisting in identifying suitable release sites and providing expertise in development of monitoring programs to assess factors affecting survival and recruitment rates to determine reasons for not meeting criteria for success. Specific to this study, we are addressing the following objectives related to the reestablishment of a viable swift fox population:

Primary objectives:

- Identify the areas within Badlands/BGNG that are suitable for reintroduction of swift foxes based on landscape and habitat characteristics.
- Estimate relative density and spatial characteristics of the coyote population in areas identified for swift fox reintroduction in Badlands/BGNG.
- Measure the demographic characteristics (survival, reproduction, dispersal, home range) of reintroduced foxes and, if possible, wild-born swift foxes to evaluate the progress of the reintroduction.

Secondary objectives:

- Compare causes of mortality, survival rates, and reproductive rates of swift foxes restored to areas with reduced coyote densities through control (BRR) and without coyote control but with release sites located on the periphery of coyote territories (Badlands/BGNG).
- Evaluate the use and importance of prairie dog colonies to swift foxes. If data are adequate, we will examine survival, mortality, and reproduction rates of swift foxes with and without access to prairie dog towns.

Herein, we report on the progress for the first two years of the reintroduction efforts (contact the people listed above for more information on methods used). Our objective for these years were to (1) identify the areas within Badlands/BGNG that are suitable for reintroduction of swift foxes based on landscape and habitat characteristics, (2) estimate spatial characteristics of the coyote population in areas identified for swift fox reintroduction in Badlands/BGNG each year; (3) translocate wild swift foxes from Colorado to selected areas of the park for release; and (4) monitor the released foxes.

RESULTS

Habitat Suitability Models

A preliminary habitat suitability model was developed with data from South Dakota GAP Project. Within the park and the 32-km buffer, suitable habitat encompassed 80% of the area.

Coyote monitoring

In March 2003, eight coyotes were live trapped and fitted with GPS collars. Location data were retrieved from seven of these collars and area use by coyote was overlaid with the habitat suitability data to identify suitable release sites for fox releases in 2003.

Because we did not reach our goal of 15 coyotes collared in preparation for the 2003 release, we modified the trapping schedule for 2004 with additional trapping attempts. We initially trapped and radiomarked 10 coyotes in October 2003. These collars were programmed differently from collars deployed in March 2003 to accommodate the needed longer battery life. Collars recorded locations every 4 hours from 0600-1800 and every hour from 1800-0600. We trapped again in April-May 2004, deploying 11 additional transmitters on coyotes. All collars were programmed to drop-off the coyotes in August 2004, however we were only able to retrieve 9 collars because of malfunctions or coyotes dispersing outside of the study area.

Thus far, in preparation for the 2005 release of swift foxes, 3 coyotes have been trapped and radiomarked.

Swift fox translocation

In 2003 (26-28 August), 40 swift foxes (21 males, 19 females) were captured in Lincoln County, Colorado. All foxes were sexed, aged, weighed, vaccinated, and blood was collected for disease analysis. Two swift fox tested positive for sylvatic plague titers and were released at their original capture location. Eight other swift foxes were also released. Thirty swift foxes (15 male, 15 female) were transported to Badlands, where they remained in quarantine pens located at the park for 14-days. In 2004 (6-13 October), 55 swift foxes (25 males, 30 females) were captured in Elbert County, Colorado. All foxes were sexed, aged, weighed, vaccinated, and blood was collected for disease analysis. Twenty-seven foxes tested positive for sylvatic plague titers and were released at their original capture location. Twenty-eight swift foxes (13 males, 15 females) were transported to Badlands where they remained quarantined for 14 days.

Swift fox release and monitoring

In 2003, swift foxes were released in Badlands National Park on 13-15 September. A pair (male/female) of foxes was hand released at each of 15 sites by freeing foxes from carrying boxes at dusk. As of 6 December 2004, 7 foxes that were released were successfully being monitored, 9 were missing (i.e., unknown fate), and 13 had died. Contact was lost early in the monitoring phase for five of these animals and they may have dispersed beyond the distance we are able to regularly monitor. They have not been detected with aerial surveillance of the nearby area. On two occasions we have observed foxes with collars, but were unable to detect a signal, thus we may have some transmitter failure. Annual survival rates (Kaplan-Meier estimates) are 39% overall, 51% for males, and 27% for females. We have retrieved 7 foxes that died. Preliminary examination indicated that coyotes likely caused 6 of the mortalities and the other mortality was a result of a vehicle collision. Released foxes have typically settled within 8 km of their release site, most often in grazed grasslands. Four pairs of foxes were established and

maintained through breeding and pup rearing periods (Fig. 2). In the fall of 2004 we replaced radios on 6 adults that were released in 2003.

In 2004, swift foxes were released into Badlands on 27 October. Four hard release sites and 9 soft release sites were selected (Fig. 3). Of the 4 hard release sites, male/female pairs were released at 2 sites and groups of 3 foxes (1 male/2 females) were released at 2 sites. A pair of foxes was released at each soft release site. As of 21 December 2004, of the 28 released foxes, 24 were being monitored, 4 had died.

Reproduction

Of the 2003 released animals, 4 pairs of foxes were indicated during the breeding and pup rearing periods. In June, pups were observed with 3 of the 4 pairs, having litters of 6, 5, and 4 pups. On 14-15 July we captured 14 of the 15 pups (5 males, 9 females, 1 unknown) and collected blood. In August 2003, we radiomarked 12 pups. Since the first week in December, 9 of the pups continue to be monitored but 4 pups have died. Notable was the death on 8 June of an adult female that had pups. The male of the pair reared the 5 pups. On 20 July an unpaired adult female began living with this family group. As of 1 December she continues to reside within the home range of the male.

DISCUSSION/SUMMARY/RECOMMENDATIONS

We were able to identify areas of overlap for low use by coyotes and habitats categorized as highly suitable for swift foxes. These overlap areas were used as release sites. This was intended to reduce the likelihood of swift foxes encountering coyotes immediately following release. We anticipated that swift fox would have a limited period to orientate to the landscape and habitats prior to contacting a coyote. In the future we plan to compare this approach of providing some protection to the foxes with reintroductions on the Bad River Ranch where coyote removal is being conducted prior to and during the reintroduction efforts.

Preliminary habitat suitability assessment results seemed intuitively reasonable and we are in the process of completed a more comprehensive assessment model. Thus far, foxes have primarily used areas considered highly suitable.

Translocation of swift foxes was efficiently completed with considerable cooperation and assistance from the Colorado Division of Wildlife. We worked with the Colorado Division of Wildlife to ensure that removal of animals to be translocated did not impact the donor populations.

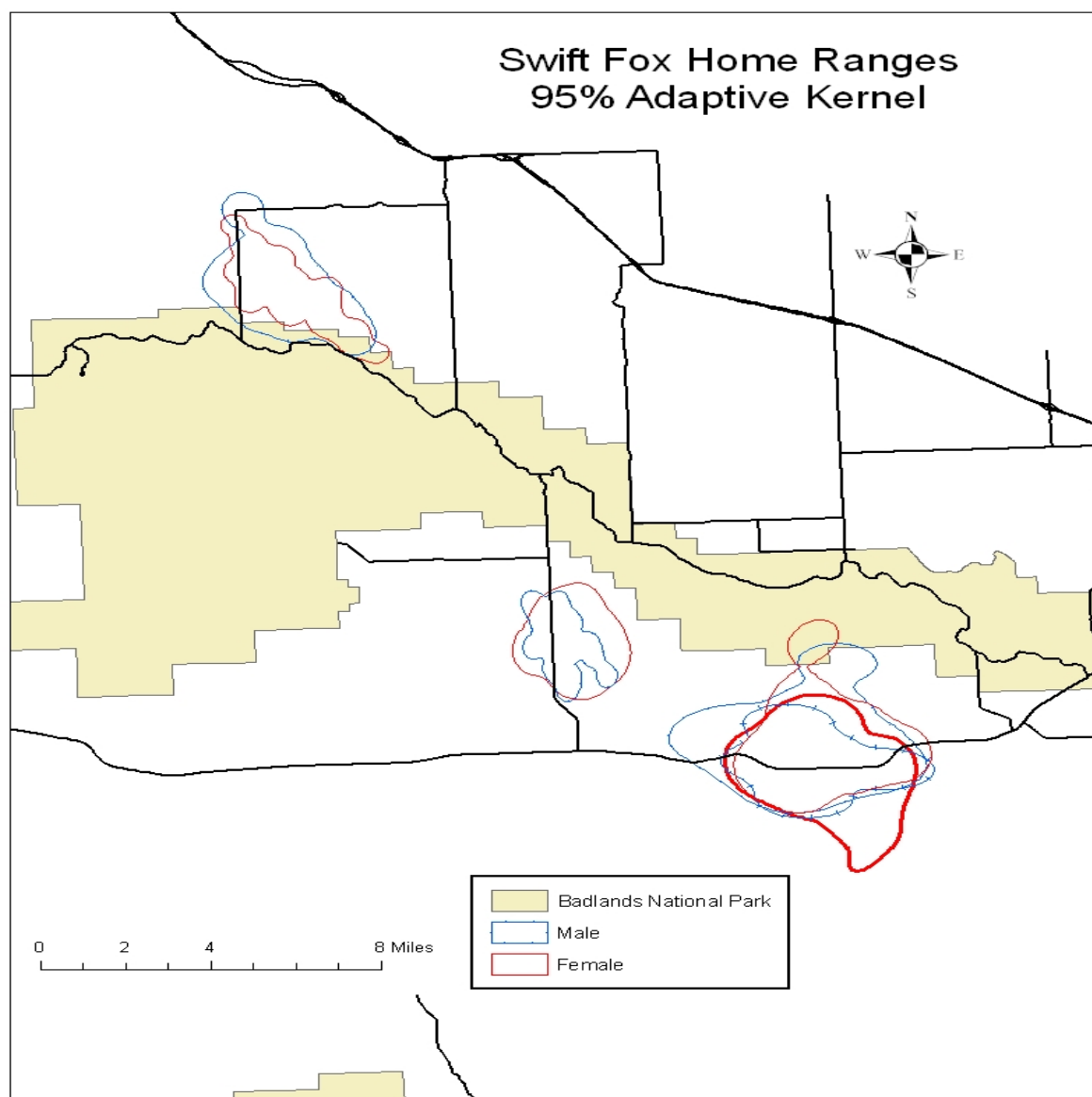


Figure 2. Home ranges for swift foxes monitored 2003-2004 . Data do not include locations recorded immediately following release while foxes dispersed into the area they finally occupied as a resident.

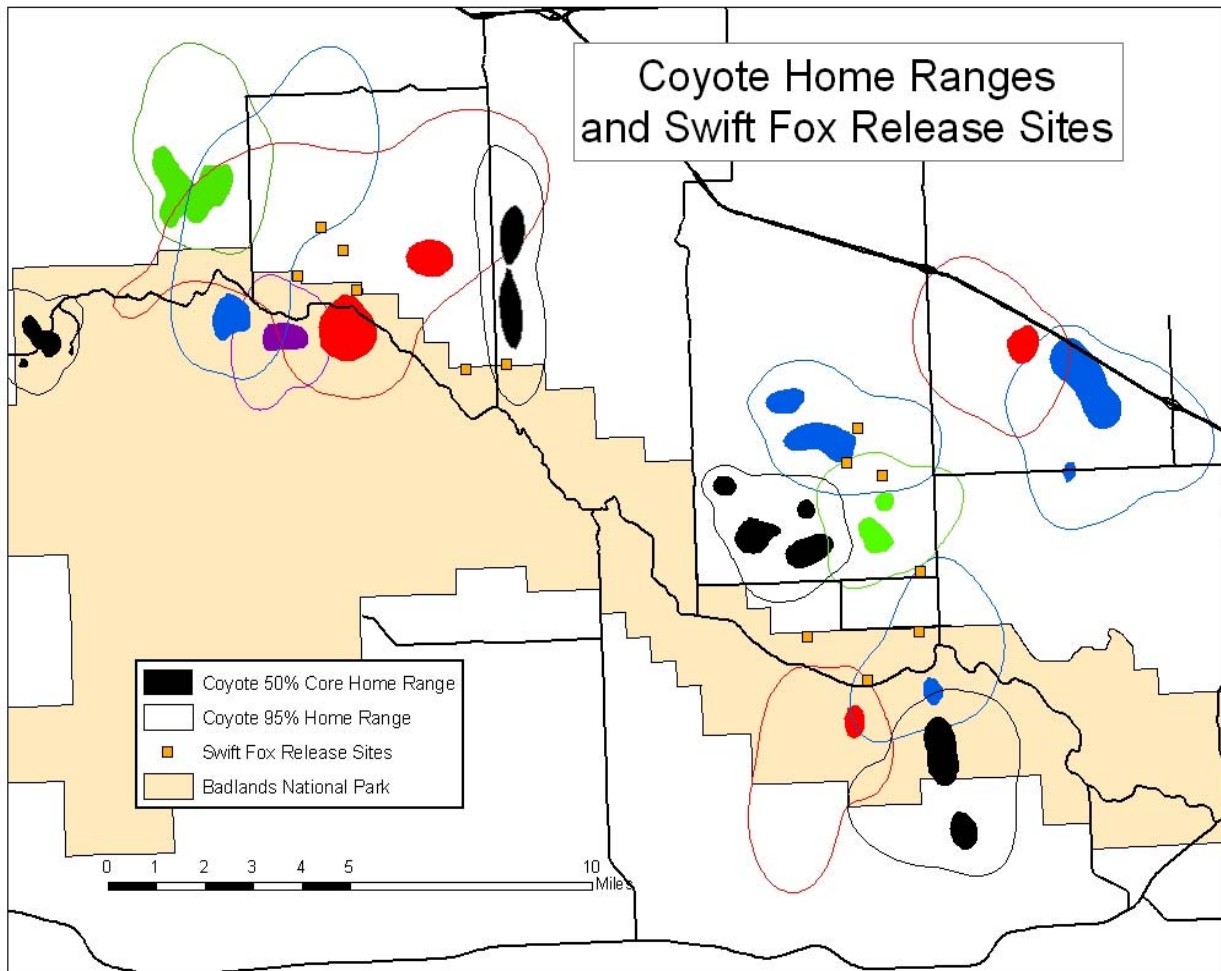


Figure 3. Area-use (95% and 50% adaptive kernel estimates) by coyotes in 2004 and locations where swift fox were released in October 2004.

No clear conclusions or attempt to declare the reintroduction a success or failure can be made at this early stage of the restoration program. The rate of mortality is not surprising; indigenous populations of swift foxes studied in other areas have reported comparable mortality rates and losses by similar fates. We are particularly pleased with the successful breeding of 3 pairs in the first year of the reintroduction.

No information is yet available to confirm that any foxes released in 2004 continue to associate with the fox they were released with or have coupled with a different fox. Breeding generally occurs in February and March so we are expecting to determine associations as we approach the breeding season. Data suggest that some foxes are behaving as pairs.

Thus far, progress is on schedule and we expect to continue to move forward with each step outlined in the project study plan. We defined criteria for success:

- Initial success (3 years) will be based on breeding of the first wild-born generation of foxes in the release area.
- Short-term criteria (3-5 years) for success will include survival and recruitment rates similar to other wild self-sustaining populations and population growth.

We will assess factors affecting survival and recruitment rates. If it appears we are not on a path to achieve success, we will use adaptive management to modify release and management strategies to alleviate problems.

SUMMARY OF SWIFT FOX INFORMATION FOR THE NATIONAL GRASSLANDS 2004

BOB HODORFF, USFS Fall River Ranger District, P.O. Box 732, 1801 Highway 18 Truck Bypass, Hot Springs, SD 57747. Tel: 605-745-4107; FAX: 605-745-4179; E-mail: rhodorff@fs.fed.us

DAKOTA PRAIRIE GRASSLANDS LITTLE MISSOURI NATIONAL GRASSLAND SHEYENNE NATIONAL GRASSLAND CEDAR RIVER NATIONAL GRASSLAND GRAND RIVER NATIONAL GRASSLAND

No formal surveys were completed. We had no incidental sightings in FY2004 (or for that matter, in calendar year 2004 to date).

Contact: Dan Svingen

FORT PIERRE NATIONAL GRASSLAND (FPNG) REPORT 2004

No swift fox were known to recently exist on FPNG until Turner Endangered Species Fund (TESF) released them on the Bad River Ranch west of FPNG. TESF personnel continue to monitor swift fox from the air and land in the general area, and a more detailed report can be obtained from them. Direct swift fox releases by TESF may occur on FPNG in the future.

Contact: Glenn Moravek

OGLALA NATIONAL GRASSLAND (ONG) REPORT 2004

No formal surveys were completed. No incidental sightings.

Contact: Jeff Abegglen

THUNDER BASIN NATIONAL GRASSLAND REPORT 2004

No formal surveys were completed by forest service personnel.

Contact: Cristi Lockman

CIMARRON NATIONAL GRASSLAND REPORT 2004

No formal surveys were completed by forest service personnel. There is a resident population of swift foxes on the Cimarron Grasslands.

Contact: David J. Augustine

COMANCHE NATIONAL GRASSLAND REPORT 2004

No formal surveys were completed by forest service personnel. There is a resident population of swift foxes on the Comanche Grasslands.

Contact: David J. Augustine

BUFFALO GAP NATIONAL GRASSLAND REPORT 2004 WALL RANGER DISTRICT

No formal surveys were completed by forest service personnel. The Badlands National Park (BNP), which is adjacent to the National Grassland, released swift fox in 2004. A detailed report on the swift fox reintroduction will be provided by the BNP.

Contact: Doug Sargent

PAWNEE NATIONAL GRASSLAND

Formal surveys were conducted in summer of 2004. A report is provided in this SFCT Annual Report.

Contact: Beth Humphrey

FALL RIVER RANGER DISTRICT

Formal surveys were conducted in summer of 2004. A report is provided in this SFCT Annual Report.

Contact: Bob Hodorff

PAWNEE NATIONAL GRASSLAND SWIFT FOX SURVEY FOR 2004

RICHARD E. HILL, Biological Science Technician (Wildlife), USFS Fall River Ranger District, P.O. Box 732, 1801 Highway 18 Truck Bypass, Hot Springs, SD 57747. Tel: 970-246-5000; FAX: 970-346-5014; E-mail: richardhill@fs.fed.us

INTRODUCTION

The swift fox (*Vulpes velox*) is a small nocturnal canid endemic to the short and midgrass prairies of western North America. The swift fox has declined over much of its former range especially the northern sub-species (*V. velox hebes*). This decline is thought to have been caused by over hunting, trapping and the poisoning programs promulgated against gray wolves (*Canis lupus*), coyotes (*Canis latrans*) and various rodents such as prairie dogs (*Cynomys* spp.). A former Candidate Species under the Endangered Species Act of 1973, as amended, it was removed from listing on January 8, 2001. The swift fox is a species of concern in Regions 1 and 2 of the USDA Forest Service. The Colorado Division of Wildlife classifies the swift fox as a non-game species of special concern.

The status of swift fox in Colorado, and in particular, the Pawnee National Grassland (PNG) is currently under investigation, but thought to be stable or increasing. .

Identifying potential habitat is the first step in developing a sound management strategy. The second step is to identify occupied habitat, one of the purposes of this annual survey. Cooperation with the Colorado Division of Wildlife, the U S Fish and Wildlife Service, and utilization of the expertise available through the University of Northern Colorado and Colorado State University will be necessary in the development of a sound management strategy.

The Forest Service is a multiple use agency. Recreational use of the PNG is increasing from year to year at an accelerating rate. Mineral development, gas and oil, is projected to remain stable or decline slightly over next several years. Other uses also have the potential to effect swift fox habitat or populations. It is important to gather enough information to proactively manage for a viable population prior to irretrievable or irreversible commitment of swift fox habitat to other uses due to ignorance of the species needs. Over a number of years this survey information should help establish a pattern of use by swift fox on the PNG identifying the key areas of habitat occupancy.

METHOD

The 2004 survey was conducted on three successive nights in September, following the standard survey route established in 1998. A minimum of 7 hours was spent spotlighting between sunset and sunrise per night.

Surveys are done in September because the young of the year have left the natal dens but are still likely to be hunting in family groups. Of lesser importance the weather is still reasonably comfortable for the surveyors.

Survey times, total survey hours, mileage, and other pertinent information were recorded. Time, location and habitat type were recorded for each swift fox observation

A survey crew of two provides adequate coverage on both sides of the vehicle.

The crew traveled the survey route at a speed of not more than 20 mph sweeping areas to the front and sides of the vehicle with 1,000,000 candlepower spotlights.

An observation was the sighting of a fox or the sighting of eye shine. Eye shine is either amber or green. Positively identified swift fox were recorded as confirmed observations. Animals thought to be swift fox but not positively identified were recorded as unconfirmed. Animals are often attracted to the first pass of the spotlight causing them to be sighted on subsequent passes. Therefore the spotlight was passed at least twice over the field of view.

Positive identification of all animals sighted swift fox or not, was attempted and noted before continuing the survey.

RESULTS

The swift fox survey for 2004 was conducted on September 14th, 15th and 16th. A total of 303 miles of the route were surveyed over the three nights. Approximately 24.5 hours were expended over the three survey nights. Nineteen fox observations were confirmed. This compares to 20 in 2003, 22 in 2002 and 40 in 2001. A majority of the observations were of lone foxes. There was one observation of more than one fox and there were two unconfirmed swift fox observations.

Other species observed: Pronghorn antelope, kangaroo rat, burrowing owl, short eared owl, owl (spp.unk)., white-tailed jackrabbit, black-tailed jack rabbit, Swainson's hawk, coyote, mule deer, domestic cattle, domestic horse, domestic cat, horned lark, homo sapien and cottontail rabbit.

DISCUSSION

Swift fox numbers have been highly variable over the life of the survey. Observations range from a high of 80 in 2000 to a low of 14 in 1990. The mean number of observations from 1990 to 2004 is 37 with a standard deviation of 19. The median number of observations is 33.5 with a range 14 to 80. However only the years from 1999 to 2004 are directly comparable, as the survey route was not standardized until 1998. Survey records go back to 1990 with missing data for the years 1992, 1995 and 1998. From 1999 to 2004 the mean number of observations is 37.6 with a standard deviation of 23.4. The median number of observations is 31 with a range of 19 to 80.

Wild carnivore populations are subject to many decimating factors that cause population declines. Predation, disease, loss of habitat, interspecific competition, cyclic food supplies, human activity and stochastic weather events all take their toll. Some are cyclical and some are not. The El Nino climate event is an example as are jackrabbit population cycles. Some cause precipitous declines and some slow declines over time.

Diseases such as distemper or rabies are examples of the former and habitat loss is an example of the latter.

This survey is not designed to separate out the factors limiting swift fox populations or to pinpoint the causes of the recent population declines. Still a few speculations are in order

Swift fox populations on the Pawnee National Grassland maybe stabilizing following a two year decline. Anecdotal evidence suggests that the drought is beginning to abate and populations of prey (lagomorphs) or potential prey species (other small mammals) are increasing. Both indicate that the swift fox population should or could begin to increase over the next several years. One dark cloud is that the coyotes, the main cause of direct mortality in swift fox populations are also increasing and may prove to be a limiting factor to swift fox population expansion. Increases in recreational use of the Grassland may also serve as a damper on any potential expansion. This could happen in several ways. Increased direct mortality from vehicle fox interactions, a potential increase in disease from domestic animals especially dogs, displacement of fox or prey species into less suitable habitat and or conversion of shortgrass prairie to other uses to name a few.

Barring any major decimating events in the immediate future the swift fox should be able to maintain a viable population on the Pawnee National Grassland. We have six years of usable population data. With about ten years worth we should be able to determine if the swift fox population will stabilize about some mean value or continue to fluctuate somewhat erratically.

Attachments:

SWIFT FOX: NIGHTLY DATA SHEET

1. DATE: 09/14/2004

2. HOURS: From: 1930 To: 0245

Total: 7.50

3. MILES DRIVEN: From: 28106.8 To: 28190.1

Total: 83.3

4. SWIFT FOX: Location, Time, and Habitat.

Confirmed

One	SE SE	Sec 27	10N 65W	2020	shortgrass
One	SW SW	Sec 12	8N 65W	2219	Shrubby short grass
One	NE NE	Sec 12	8N 64W	2313	Shortgrass
One	NE SE	Sec 35	10N 64W	0137	Shortgrass
One	SE SE	Sec 11	10 N 64W	0156	Shortgrass
One	NE SE	Sec 4	10N 64W	0237	Shortgrass

Total Confirmed: 6

Unconfirmed:

One	SE SE	Sec10	10N 65W	2040	Shortgrass/midgrass
One	SE SW	Sec 4	10N 65W	0230	Shortgrass/midgrass

Total unconfirmed: 2

5. PHOTOS TAKEN:

6. NAME, ADDRESS, PHONE, AGENCY:

Richard E. Hill
USDA Forest Service
660 "O" Street
Greeley, CO 80631
Biological Science Technician

Sue Bauer
USDA Forest Service
660 "O" Street
Greeley, CO 80631
Resource Clerk

7. WEATHER CONDITIONS: Cool low 50's, partly cloudy, thunderstorms, windy gusts to 30+ mph.

8. METHOD: Spotlights from vehicle

9. MAP: Survey route, Locations.

10. Other species: Black-tailed jackrabbits, white-tailed jackrabbits, cottontail rabbits, k-rats, coyote, pronghorn, cattle, homo sapien.

SWIFT FOX: NIGHTLY DATA SHEET

1. DATE: 09/15/2004

2. HOURS: From: 1925 To: 0330 Total: 7.50

3. MILES DRIVEN: From: 28277 To: 28376 Total: 99.0

4. SWIFT FOX: Location, Time, and Habitat.

Confirmed

One	NE NE	Sec 21	8N 60W	1955	shortgrass
One	NE NE	Sec 4	9N 58W	2258	Shortgrass/saltbush
One	NE NE	Sec 10	8N 59W	2359	Shortgrass
One	SE Se	Sec 3	8N 59W	0042	Shortgrass
One	NE NE	Sec 3	8N 59W	0054	Shortgrass
One	NW NE	Sec 4	7N 58W	0256	Shortgrass
One	NE SE	Sec 21	8N 59W	0319	Shortgrass

Total Confirmed: 7

5. PHOTOS TAKEN:

6. NAME, ADDRESS, PHONE, AGENCY:

Richard E. Hill
USDA Forest Service
660 "O" Street
Greeley, CO 80631
Biological Science Technician

Beth Humphrey
USDA Forest Service
660 "O" Street
Greeley, CO 80631
Wildlife Biologist

7. WEATHER CONDITIONS: Cool mid 40's, clear calm light breeze

8. METHOD: Spotlights from vehicle

9. MAP: Survey route, Locations.

10. Other species:

Black-tailed jackrabbits, white-tailed jackrabbits, cottontail rabbits, k-rats, coyote, pronghorn, cattle, short eared owl

SWIFT FOX: NIGHTLY DATA SHEET

1. DATE: 09/16/2004

2. HOURS: From: 1920

To: 0511

Total: 9.50

3. MILES DRIVEN: From: 28699

To: 28820

Total: 121.0

4. SWIFT FOX: Location, Time, and Habitat.

Confirmed:

One	NE NE	Sec 10	10N 65W	0407	Shortgrass
One	SW SW	Sec 11	10N 64W	0415	Shortgrass
One	SW SW	Sec 35	10N 65W	0434	Shortgrass
Two	NW SW	Sec 2	9N 65W	0450	Shortgrass
One	SW NE	Sec 22	9N 65W	0505	Shortgrass

Total Confirmed: 6

5. PHOTOS TAKEN:

6. NAME, ADDRESS, PHONE, AGENCY:

Richard E. Hill
USDA Forest Service
660 "O" Street
Greeley, CO 80631
Biological Science Technician

Steve Kittrel
USDA Forest Service
660 "O" Street
Greeley, CO 80631
Biological Science Technician

7. WEATHER CONDITIONS: Cool, 50's clear light breeze

8. METHOD: Spotlights from vehicle

9. MAP: Survey route, Locations.

10. Other species:

Black-tailed jackrabbit, white-tailed jackrabbit, cottontail rabbit, k-rat, coyote, pronghorn, domestic cattle, owl (spp unknown), domestic cat, domestic horse, burrowing owl, mule deer, Swainson's hawk.

**2004 SWIFT FOX SURVEY: FALL RIVER RANGER DISTRICT,
BUFFALO GAP NATIONAL GRASSLAND,
NEBRASKA NATIONAL FOREST**

LYNN ALLAN HETLET, USFS Fall River Ranger District, P.O. Box 732, 1801
Highway 18 Truck Bypass, Hot Springs, SD 57747. Tel: 605-745-4107; FAX:
605-745-4179; E-mail: lynnalan@gwtc.net

INTRODUCTION

Surveys to determine locations of swift fox (*Vulpes velox*) were conducted on the Fall River District of the Buffalo Gap National Grassland from 1989 through 2003. A route routinely run in the Ardmore area occurs within an area designated as a Special Plant and Wildlife Habitat: Swift Fox. Additional routes were added in this area to give more complete coverage in 2004.

SURVEY AREAS

Previously routes had been established in the Swift Fox Wildlife Management Area only in areas where swift fox were known to have occurred. In 2004, additional routes were added to give a more complete coverage of the area.

The surveys done in the Swift Fox Management Area in 2004 surveyed approximately 12,000 acres (Maps 1-3), and an additional 1,600 acres were surveyed in the Igloo area (Map 4). The route near Igloo was established in what appears to be ideal swift fox habitat, but had not been surveyed since 1997.

METHODS

Approximately 160 man-hours (including travel time) were spent establishing and utilizing bait stations. A bait station consists of a circular area 18 to 20 inches in diameter cleared of all vegetation. A mixture of fine masonry sand and vegetable oil is spread over the area and smoothed. The mixture consists of one cup of oil thoroughly mixed into one gallon of sand.

Approximately one-half ounce of canned jack mackerel is placed in the center of the station to serve as bait. Because of the swift fox's primarily nocturnal habits, the stations are baited during the early evening hours to insure that the bait is fresh and odoriferous through as many hours of the night as possible.

This sand/oil mixture will hold a track impression quite well, and if insects such as grasshoppers and carrion beetles are not abundant enough to be a significant disturbance to the bait and sand, (through either digging or simply hopping through it), it is not necessary to check the sites early; however, the slanting light of the early hours greatly facilitates seeing details in the track.

Bait stations were placed at a minimum density of four per section, following ridge tops where possible to give better scent dispersal on the evening downdrafts.

Ideally, each route is run three consecutive days. If weather prevents this, any three of five days is acceptable.

RESULTS AND DISCUSSION

The area surveyed on the Hollow Creek, Hay Creek and Mule Creek Allotments (Map 1) resulted in tracks of swift fox at 15 stations, coyotes at 1, cottontail species at 1, American badger at one, prairie dogs at 2, and unidentified small rodents at 25, from a total of 96 bait station-nights (Table 1).

The area surveyed on the Fox, Moody, and Miller Allotments (Map 2) resulted in tracks of swift fox at 7 (with an additional one discovered on one station on 8-11-05, more than a month after the survey was completed) coyotes at 1 station, cottontail species at 1, striped skunk at 6 (possibly one more), raccoon at 1, pronghorn at 1, and unidentified small rodents at 8, from a total of 84 bait station-nights (Table 2).

The area surveyed on the Henry and Ross Allotments (Map 3) resulted in tracks of swift fox at 4 stations (with swift fox scat at another, and an additional identifiable swift track found at one station 5 days after completion of the survey), striped skunk at 5, and unidentified small rodents at 9, from a total of 45 bait station-nights (Table 3).

The survey in the Igloo area (Map 4) resulted in striped skunk tracks at 4 stations, American badger at one station, and cottontail rabbit at 2, from a total of 36 bait station-nights (Table 4).

It is encouraging to once again find swift fox tracks in the Fox Allotment, where they were absent last year, but had been found consistently in the past, to find them again in the Ross Allotment, where they have not consistently been found for several years, and to find them again on the newly acquired Hunter Land Exchange (Hollow Creek, Hay Creek, and Mule Creek Allotments).

The sand/oil mixture used as a tracking substrate generally hardens after two days of typical August weather, and must be stirred before re-baiting the third night. This means that the two tracks found after the completion of the survey had to be made within a day or two of the last baiting. The fact that clear, identifiable tracks were found nearly a week after the surveys were completed, is a testament to the holding power of this mixture. It also suggests that it could be worthwhile to do a quick drive-through of the routes several days after the survey to possibly pick up evidence of additional swift fox visits to the bait stations.

Table 1. Swift Fox Survey, Swift Fox Wildlife Management Area, Ardmore, South Dakota

Allotment	Station #	Date- 8-10	Date- 8-11	Date- 8-12
		Tracks of Species		
Mule Creek (East pasture)	1	VUVE	VUVE	VUVE
	2	VUVE	VUVE	VUVE
	3	VUVE		
	4		Rodent	Rodent
	5		VUVE	Rodent
	6			
	7			
	8	VUVE		VUVE
	9			Rodent
	10			
	11	VUVE	Rodent	Rodent
	12		VUVE	VUVE
	13		VUVE Rodent	VUVE
Hay Creek	14	Rodent	Rodent	Rodent
	15	SYSP		
	16	Rodent		
	17			
	18			
	19		Rodent	
	20	Rodent	Rodent	Rodent
	21	TATA		Rodent
Hollow Creek	22			
	23			
	24	Rodent	Rodent	Rodent
	25			CALA
	26		CYLU	CYLU
	27		Rodent	Rodent
	28			
	29			
	30			
	31	Rodent		
	32	Rodent	Rodent	Rodent

VUVE – swift fox

CALA – coyote

TATA – American badger

SYSP – cottontail rabbit species

CYLU – black-tailed prairie dog

Rodent – unidentified small rodent species

Table 2. Swift Fox Survey, Swift Fox Wildlife Management Area, Ardmore, South Dakota

Allotment	Station #	Date- 8-3	Date- 8-4	Date- 8-5
		Tracks of Species		
Fox	1			VUVE? MEME?
	2			
	3	Rodent		
	4			
	5			
	6	MEME CALA		VUVE*
	7		MEME	MEME VUVE
	8			
	9	VUVE	VUVE	VUVE PRLO
	10			
	11	VUVE	VUVE	VUVE
	12			
	13			
	14		MEME	MEME
	15	ANAM		
Moody	16	Rodent		MEME
	17			
	18			
	19	Rodent		
	20			
	21	Rodent		
	22	Rodent SYSP		Rodent
	23			
	24			
	25			
Miller	26		Rodent	Rodent
	27			
	28			

VUVE – swift fox

MEME – striped skunk

ANAM – pronghorn

CALA -- coyote

SYSP – cottontail rabbit species

PRLO -- raccoon

Rodent – unidentified small rodent species

* Track discovered 8-11-05, six days after the completion of the survey.

Table 3. Swift Fox Survey, Swift Fox Wildlife Management Area, Ardmore, South Dakota

Allotment	Station #	Date- 8-10	Date- 8-11	Date- 8-12
		Tracks of Species		
Henry	1		VUVE	VUVE MEME
	2			VUVE
	3			
	4			
	5		Rodent	Rodent
	6		Rodent	Rodent
	7		Rodent	Rodent
	8			MEME
Ross	9		Rodent	MEME
	10			Rodent
	11			
	12			
	13		Rodent	VUVE*
	14			
	15	VUVE	MEME	VUVE** MEME

VUVE – swift fox

MEME – striped skunk

Rodent – unidentified small rodent species

* Track found on 8-17-04, five days after completion of the survey.

** Swift fox scat only

Table 4. Swift Fox Survey, Igloo Area

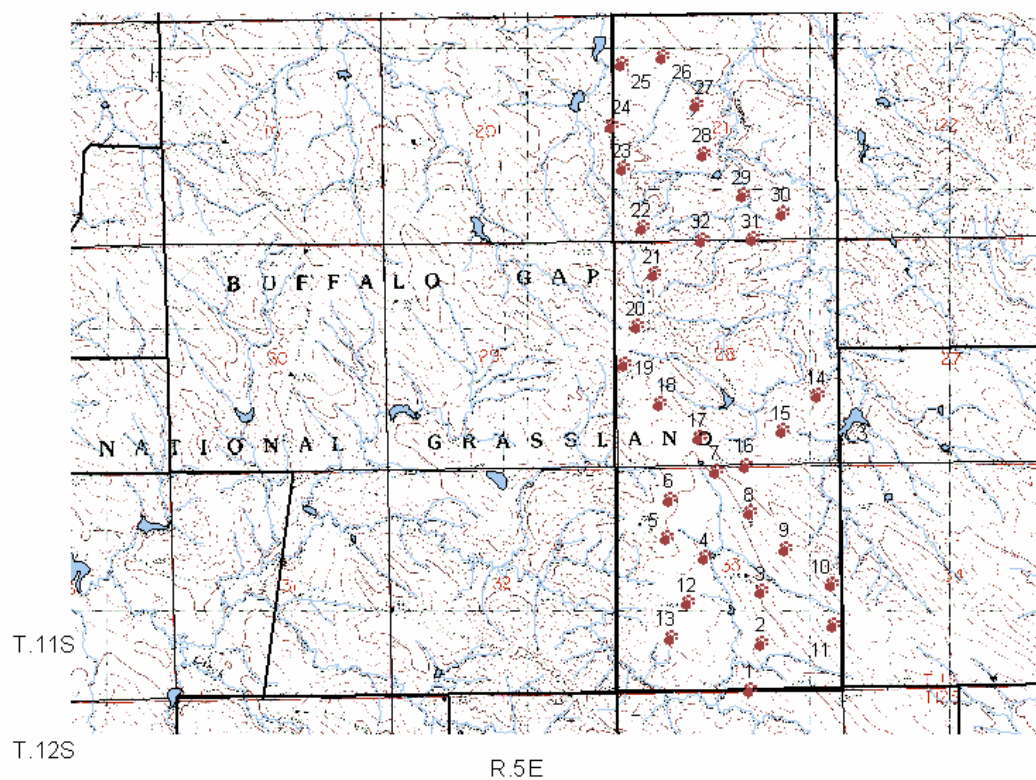
Allotment	Station #	Date- 8-31	Date- 9-1	Date- 9-2
		Tracks of Species		
West	1			
	2			
	3			SYSP
	4			MEME
	5		MEME	MEME
	6			
	7			TATA
	8			
Pfister	9			MEME
	10			SYSP
	11			
	12			

MEME – striped skunk





TATA – American badger

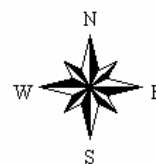
SYSP – Cottontail rabbit species

Map 1. 2004 Swift Fox Survey,
Hollow Creek/Hay Creek/
Mule Creek Allotments

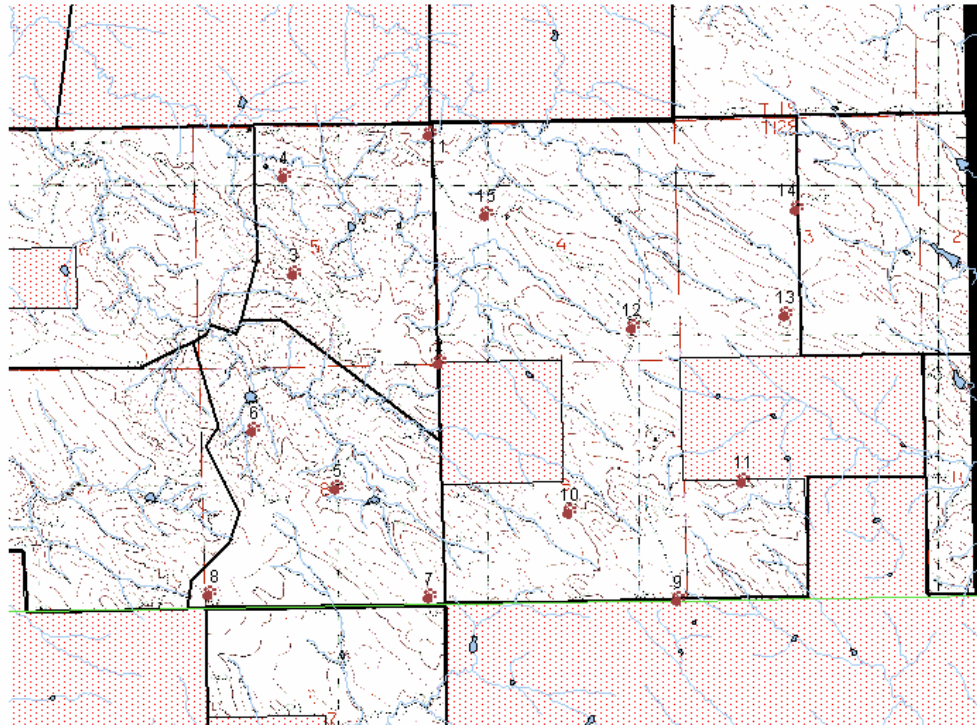


0.8 0 0.8 1.6 Miles

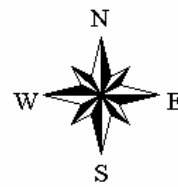
-  Bait Station
-  Ponds
-  Roads.shp
-  Section Lines
-  Pasture Boundaries
-  Drainages.



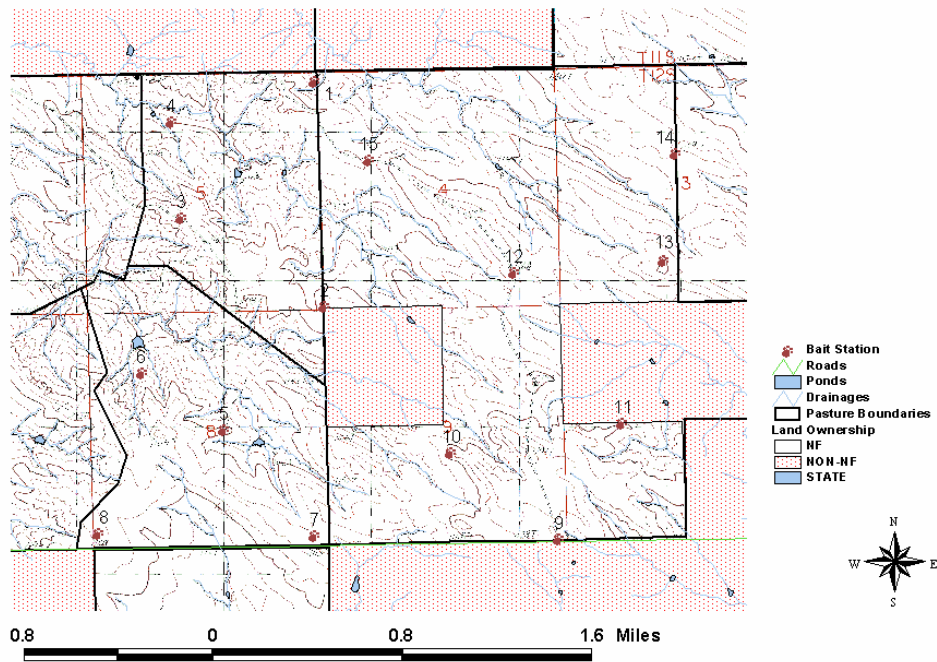
Map 2. 2004 Swift Fox Survey
Fox/Miller/Moody Allotments



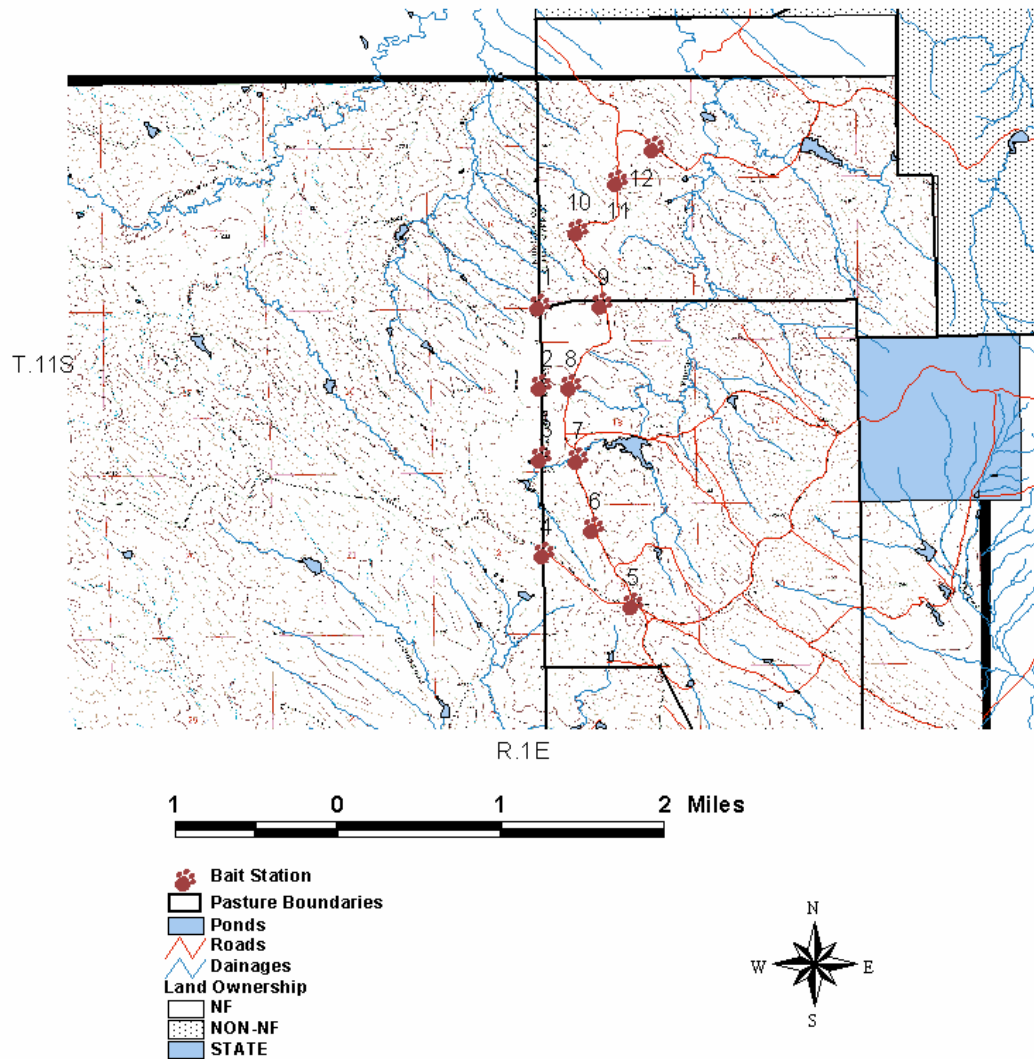
- Bait Station
- Roads
- Ponds
- Drainages
- Pasture Boundaries
- Land Ownership**
- NF
- NON-NF
- STATE



Map 3. 2004 Swift Fox Survey
Ross/Henry Allotments



Map 4. 2004 Swift Fox Survey
Igloo Area



ENSURING RESTORATION OF SWIFT FOX ON THE FT. PECK INDIAN RESERVATION AND IN NORTHEASTERN MONTANA

KYRAN KUNKEL, Wildlife Biology Program, University of Montana and Mountain Thinking Conservation Science Collaborative, 1875 Gateway South, Gallatin Gateway, MT 59730. Tel: 406-763-4109; FAX: 406-556-8501; E-mail: kyran@montana.net

ROBERT MAGNAN, Fish and Wildlife Department, Fort Peck Tribe, Box 1027, Poplar, MT 59255.

LES BIGHORN, Fish and Wildlife Department, Fort Peck Tribe, Box 1027, Poplar, MT 59255.

Cooperators: Montana Fish Wildlife and Parks; Bureau of Land Management

Factors affecting the likelihood of swift foxes to persist and to recolonize former ranges need to be assessed so that proactive management can be developed to ensure swift fox restoration. The Ft. Peck Indian Reservation (FPIR) appears to have good fox habitat and could serve as an important area for fox recolonization providing increased robustness to the fox population along the Montana-Canada border. The FPIR could also serve as an important area for expanding and eventually connecting fox populations to more southern regions. We initiated a 3-year project assessing the potential for natural recolonization by swift fox of the FPIR. We will determine factors affecting recolonization so that appropriate management can be developed to better ensure fox restoration in the region. Proactive management prescriptions may include habitat restoration and protection, predator management, and fox population reintroduction or augmentation via translocation. We initiated surveys for swift fox and their predators and prey on FPIR in fall 2004. We examined landscape features for suitability for foxes. We began trapping for foxes on FPIR in January 2005. We captured and radio collared 1 fox in the extreme northwest corner of the reservation. Our trapping success and survey work indicates that foxes have likely expanded only to the north and west perimeters of the FPIR to date. We plan to expand trapping to the northwest of the FPIR where sign indicates presence of fox. Dispersal, survival, and reproductive rates of radio collared foxes and factors affecting these parameters will allow us to determine the rate and likelihood of fox population expansion and persistence in the region. We will integrate our work with the Montana/US swift fox survey planned for winter 2005-2006. We will work with local people to ensure optimization of fox management and restoration.

SWIFT FOX REINTRODUCTIONS ON THE BLACKFEET INDIAN RESERVATION, MONTANA: DETERMINING SUCCESS

DAVID E. AUSBAND, 203 Health Sciences Bldg., The University of Montana-Missoula, Missoula, MT 59802. Tel: 406-243-4104; E-mail: daveausband@yahoo.com

This synopsis describes swift fox research currently in progress on the Blackfeet Indian Reservation, Montana. Data collected to date has not been fully analyzed and this brief report merely highlights preliminary findings.

From 1998 to 2002, Defenders of Wildlife and the Blackfeet Indian Nation reintroduced 123 captive-reared, mostly juvenile, swift fox to the 1.5 million-acre Blackfeet Reservation in northern Montana (Fig. 1).

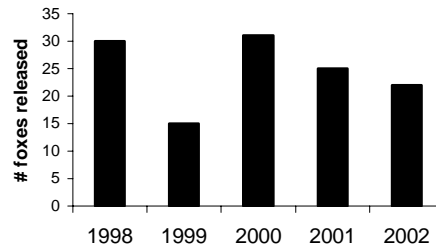


Figure 1. Number of captive-raised swift fox released on Blackfeet Indian Reservation, Montana (1998-2002).

The goal of our current research project is to determine if there is a growing population ($\lambda \geq 1.0$) of at least 100 animals. If the population meets these 2 criteria we will consider the Blackfeet reintroduction successful.

To obtain matrix-based growth rate estimates for the population, we have radio-collared both adult and juvenile foxes. Adult survival from June 2003 to June 2004 was approximately 0.73 (0.52 – 0.94, 95% CI). In addition, juvenile survival from September 2003 through May 2004 (9 month) was approximately 0.56 (0.32 – 0.80). Kit survival from June-August 2004 (3 month) was approximately 0.69 (0.55 – 0.83). The proportion of foxes reproducing in 2004 was 0.60 for juveniles and 0.70 for adults. Litter sizes in 2004 averaged 4.0 ± 0.39 (SE). Based on these estimates population growth from June 2003 to June 2004 was 18%.

Coyotes have been the largest contributors to swift fox mortality (54%) with raptors, vehicles, badgers and unknowns accounting for the remainder of mortality on the Reservation (Fig. 2).

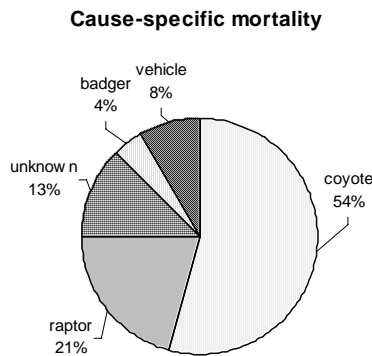


Figure 2. Causes of radio-collared swift fox mortality on the Blackfeet Indian Reservation (May 2003-March 2005) (n = 24).

In order to estimate fecundity for both juveniles and adults, field crews located 14 natal dens (Fig. 3) and observed a total of 82 animals during the summer of 2004.

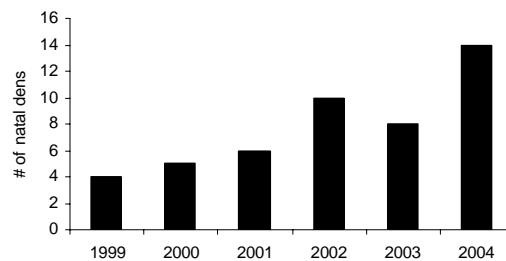


Figure 3. Number of natal dens located on Blackfeet Indian Reservation, Montana (1999-2004).

We have also begun efforts to further familiarize the public on and around the Reservation with the swift fox reintroduction. In particular, we offered \$100 rewards during the summer of 2004 for reports that lead us to previously undiscovered natal dens. By advertising this reward in local newspapers and having an informational booth at the Native American Indian Days pow-wow in Browning, Montana we were able to obtain locations of 5 additional natal dens. We believe that even if the public had not reported natal dens during the summer of 2004 – which they did – the value of our outreach efforts cannot be overstated and will benefit us in future population monitoring.

Decisions regarding further population augmentation will be conducted after the author analyzes the collected data and formally submits a thesis in autumn 2005 with the University of Montana-Missoula.

KAINAI (BLOOD TRIBE) SWIFT FOX REINTRODUCTION PROGRAMME

CLIO SMEETON, Cochrane Ecological Institute, PO Box 484, Cochrane, AB T4C1A7, Canada. Tel: 403-932-5632; FAX: 403-932-6303; E-mail: cei@nucleus.com

The Kainai (Blood Tribe) Siinopaa (swift fox) Reintroduction Programme is the first reintroduction of an Endangered species by an Aboriginal Tribe on Aboriginal land in Canada. The programme is intended to be a five-year initiative, to return this endangered species back onto the historic range, from which it had been extirpated by the 1920's. The Kainai Siinopaa Reintroduction programme is an Elder Directed Initiative, supported by Blood Tribe Chief and Council through a Band Council Resolution.

The ground work for the Kainai Siinopaa Reintroduction began in September 2001, with a meeting between the Blood Tribe Chief and Council, the Mookakin Foundation, Red Crow Community College, the Horn Society, the Spiritual Advisors to the Blood Tribe, and the Cochrane Ecological Institute (CEI). Letters of support for the programme were provided by the Blackfeet Nation, Blackfeet Fish & Wildlife Department, Waterton National Park, the Federation of Alberta Naturalists, Rt. Honourable Mike Cardinal, the Minister of Sustainable Resource Development, Government of Alberta, the Rt. Honourable, David Anderson, Minister of the Environment, Government of Canada, the Nature Conservancy of Canada, and local ranchers.

“Biophysical inventories on Reserve lands are lacking...” (Chief - Wildlife Conservation, Canadian Wildlife Service, Prairie and Northern Region, Environment Canada). Over 2003, a biophysical survey of the Northern pasture, an area of moist mixed grass prairie within the 550 sq. miles of the Blood Tribe Lands, was undertaken by the CEI and funded by Alberta EcoTrust Foundation. Increased oil and gas exploration on the Northern pasture decided the Blood Tribe to focus on the southern fescue prairie habitat of the more southerly part of the Blood lands, adjacent, off-Reserve, to areas protected under agreement with the Nature Conservancy of Canada. This biophysical survey, flora and fauna, was undertaken in 2004, and also undertaken by the CEI, funded in part by a Grant from Environment Canada.

In addition, the CEI in partnership with the Traditional Land Use Studies Department of Red Crow Community College developed a field skills training programme (species identification, statistics, radio telemetry, GIS) for Blood Tribe Beneficiaries. Red Crow Community College also collected Traditional Environmental Knowledge on the oral history and historic swift fox occurrence on Blood Tribal Lands as part of the Kainai Siinopaa Reintroduction.

Blood Tribe lands are classic swift fox habitat, and are joined by a north – south corridor of suitable protected habitat (Nature Conservancy of Canada, Waterton National Park, Canada, Glacier National Park, USA) to the Blackfeet, Montana, Reintroduction site.

The Government of Norway is intending a captive-breeding for reintroduction programme for their endangered arctic fox, *Alopex lagopus*, and sent a deputation to visit

the CEI captive breeding programme, proposed reintroduction site (Blood Tribe, Canada) and existing (Blackfeet Tribe, MT). We were fortunate that Dave Ausband and his crew were able to show us a natal den site occupied by a female, reintroduced in 1998, and her four cubs, born in 2004.

We reintroduced a small number (15) of swift fox, juveniles and adults, on Blood Tribe lands in 2004. Survival has been satisfactory, the 5 radio-collared animals were monitored from the date of release, and a pair of uncollared animals were noted repeatedly in the reintroduction site in early March 2005.

Due to the support for this programme of AAZA and the canid TAG, we were fortunate in having 8 founder foxes donated to this programme by Pueblo Zoo, Colorado, and the Wild Canid Survival and Research Centre, Missouri. These new animals will serve as founder foxes and have increased the CEI pairs to 20. Judging from the belly fluff we are beginning to find in the breeding pens, we are hoping that 2005 will be a good year!

SWIFT FOX REINTRODUCTION FEASIBILITY STUDY – LOWER BRULE SIOUX TRIBE

SHAUN M. GRASSEL, Lower Brule Sioux Tribe Department of Wildlife, Fish and Recreation, PO Box 246, Lower Brule, SD 57548. Tel: 605-473-5666; Cell: 208-305-2230; E-mail: shaung@cableone.net

INTRODUCTION

The Lower Brule Sioux Tribe is working toward the reintroduction of swift fox to tribal lands located in central South Dakota. In 2004, the Tribe initiated a feasibility study to determine population levels of potential swift fox prey and potential predators of swift fox. Grassland birds, burrowing owls, ground beetles and other insects, grasshoppers, small mammals, prairie dogs, and coyotes were surveyed. Other objectives are to determine the amount of suitable habitat and to determine disease presence in furbearers. The U.S. Fish and Wildlife Service Tribal Wildlife Grant Program, Defenders of Wildlife, and the Lower Brule Sioux Tribe Department of Wildlife, Fish and Recreation provided funding for the study.

STUDY AREA AND METHODS

The Lower Brule Sioux Reservation is located in central South Dakota on the west bank of the Missouri River and is within the historical range of the swift fox. The topography ranges from rugged river breaks to gently undulating prairie. The landscape is predominately rangeland (approximately 82%) with cropland (approximately 17%) present where soils and slope are conducive. The reservation is approximately 215,000 acres, of which approximately 153,000 acres is tribal trust or individual allotted lands. In addition, approximately 25,000 acres of tribal land are located adjacent to but outside the reservation boundary.

Grassland bird point transect surveys were conducted during the first three hours of daylight. All birds observed within a ten-minute period were identified by sight and/or sound and the distance to each observation was estimated and recorded. Burrowing owls were surveyed during the first three hours of daylight. Area searches of prairie dog colonies were conducted. All burrowing owls observed were counted and recorded as either adult or juvenile. Ground beetles and other insects were collected using pitfall traps. Cans (one-gallon capacity) were buried into the ground along a 100 meter transect at five meter intervals. The tops of the sunken cans were flush with the surrounding ground level. An eight inch aluminum drift fence was placed along the transect to guide insects into the pitfalls. Sites were surveyed for four consecutive days.

Grasshoppers were surveyed by walking one-mile transects. All grasshoppers observed within a one-meter strip were counted. Transects were established along the edge of CRP fields, in native prairie, along the edge of croplands, and in prairie dog colonies.

Small mammals were surveyed using Sherman traps arranged in a trapping web. Each web consisted of ninety-three traps. Traps were placed at ten meter intervals along ten

transects, 90 meters in length, that radiated from a central point. Three traps were placed at the center of the web. Traps were baited with a mixture of rolled oats, peanut butter and bacon grease and pre-baited for three consecutive nights. Sites were surveyed for four consecutive nights.

Prairie dogs were surveyed by counting all prairie dogs observed within four-hectare plots. The method follows the sampling approach described by Severson and Plumb (1998).

Coyotes were surveyed by conducting fecal line transect surveys. Transects were all one-mile in length. The method follows the sampling approach described by Gerads (2000). Transects were walked and all coyote scat observed was counted and removed. The transects were cleared of scat two to three weeks before initiating the survey. A habitat suitability analysis was conducted on tribal and allotted lands within the Lower Brule Sioux Reservation and tribal trust lands outside but adjacent to the reservation. Suitable habitat was defined as grasslands and croplands that have a slope of 0 to 10%. Blood samples were collected from coyotes and other furbearers during the fall and winter months to test for disease presence. Coyotes and other furbearers that were harvested by local hunters and trappers as well as coyotes harvested by Department personnel because of complaints were sampled. Diseases being tested for include sylvatic plague, canine distemper, tularemia, and canine parvovirus. Samples include whole blood samples collected by syringe or by saturating blood filter strips. Whole blood samples are placed into a test tube and spun in a centrifuge to allow blood separation. The serum is removed and stored in a freezer. Blood filter strips are allowed to dry and stored.

RESULTS

Grassland bird point transects were conducted June 6 – June 30. Nine sites, each containing four count stations, were surveyed on three occasions. A total of 848 birds were counted. Data was analyzed using Distance 4.1 software (Thomas et al. 2003), which yielded an estimated 0.71 birds/acre. Seventeen different bird species were observed and all but three observations were identified.

Burrowing owl surveys were conducted July 7 – 28 on 24 black-tailed prairie dog colonies that ranged in size from 22 to 210 acres. A total of 261 burrowing owls (63 adult and 198 juvenile) were counted. An average of 11 burrowing owls (3 adult and 8 juvenile) were counted per site. The highest total number counted at one prairie dog colony was 48 (9 adult and 39 juvenile). The average burrowing owl density on prairie dog colonies was 0.277/acre (0.052 adults/acre and 0.175 juveniles/acre). The highest burrowing owl density observed on a prairie dog colony was 1.655/acre (0.310 adults/acre and 1.345 juveniles/acre).

Ground beetles and other insects were collected in pitfall traps from August 2 – September to September 3. Nine sites were surveyed. A total of 1053 specimens were collected. The primary specimens collected were beetles (N = 324), grasshoppers (N = 244), and spiders (N = 144).

Grasshopper jump count surveys were conducted on 11 transects from August 10 – September 13. A total of 17,549 grasshoppers were counted. An average of 1,595 were counted per transect. Individual counts ranged from a low of 198 (prairie dog town) to a

high of 4,626 (CRP). The average grasshopper density was 0.997/m². Grasshopper density ranged from 0.317/m² (prairie dog habitat combined) to 2.026/m² (CRP habitat combined).

Small mammal trapping surveys were conducted September 3 – October 8. Nine sites were trapped for 4 consecutive nights yielding 3,348 trap nights. A total of 464 individual small mammals were captured. In total, small mammals were captured on 828 occasions (including re-captures), which yielded a 0.247 catch-per-unit effort. Small mammal density was estimated to be 16.1/acre. Data was analyzed using Distance 4.1 software (Thomas et al. 2003). Nine different small mammal species were captured. Black-tailed prairie dog surveys were conducted on eight prairie dog colonies that ranged in size from 22 to 210 acres between October 19 and November 16. An average of 18.7 prairie dogs per hectare were counted (range = 6.3 – 34.8).

Eleven fecal line transects were initially cleared from September 20 – October 5, 2004. Transects were first surveyed October 19 – October 30, 2004. Nineteen fecal piles were observed during the first survey. The second survey was conducted October 29 – November 16, 2004. Eleven fecal piles were detected during the second survey. The estimated mean relative density without incorporating a correction factor was 39. When the correction factor of 0.775 (Gerads 2000) was incorporated the estimated mean relative density was 50. By incorporating the model developed by Stoddart et al. (2001) the survey estimated 2.6 coyotes per km².

The habitat suitability analysis indicated that there are approximately 149,565 acres of habitat suitable for swift fox. In addition, Kunkel et al. (2001) estimated that the Lower Brule Sioux Reservation was capable of supporting up to 178 swift fox.

Blood samples collected from coyotes and badgers have yet to be analyzed. Blood samples have been collected from a total of 14 coyotes, three badgers and one raccoon. Whole blood samples have been collected from six coyotes, one badger and one raccoon. Blood filter strip samples have been collected from eight coyotes and two badgers.

DISCUSSION

In 2005, the Lower Brule Sioux Tribe will be repeating the surveys conducted in 2004. At the conclusion of the study a Feasibility Study Report and Reintroduction and Monitoring Plan for swift fox will be published.

The Lower Brule Sioux Tribal Council has authorized the reintroduction of swift fox.

The Department of Wildlife, Fish and Recreation is seeking funds to release swift fox in the Fall of 2006. All swift fox released will be radio-collared and monitored to determine dispersal, home range, survival, and reproduction.

LITERATURE CITED

- Gerads, J. R. 2000. Factors influencing use of fecal line surveys for estimating trends in predator populations in western South Dakota. M. S. Thesis. South Dakota State University. Pp. 138.
- Kunkel, K., K. Honness, and M. Phillips. 2001. Plan for restoring swift fox to west-central South Dakota. Turner Endangered Species Fund Conservation Report 01-02, Bozeman, MT.

- Severson, K. E. and G. E. Plumb. 1998. Comparison of methods to estimate population densities of black-tailed prairie dogs. *Wildl. Soc. Bull.* 26(4):859-866.
- Stoddart, L. C., R. E. Griffiths, and F. F. Knowlton. 2001. Coyote responses to changing jackrabbit abundance affect sheep predation. *J. Range Manage.* 54(1):15-20.
- Thomas, L., J. L. Laake, S. Strindberg, F. F. C. Marques, S. T. Buckland, D. L. Anderson, K. P. Burnham, S. L. Headley, J. H. Pollard, and J. R. B. Bishop. 2003. Distance 4.1. Release 2. Research Unit for Wildlife Population Assessment, University of St. Andrews, UK. <http://www.ruwpa.st-and.ac.uk/distance/>

**THE INFLUENCE OF HABITAT FRAGMENTATION ON SWIFT FOX
(*VULPES VELOX*) DISTRIBUTION, HABITAT UTILIZATION,
AND GENETIC DIVERSITY IN TEXAS**

DONELLE SCHWALM, Department of Range, Wildlife, and Fisheries Management,
Texas Tech University, Box 42125, Lubbock, TX 79409-2125. Tel: 806-742-
1983; FAX: 806-742-2281; E-mail: doni.schwalm@ttu.edu

WARREN BALLARD, Department of Range, Wildlife, and Fisheries Management,
Texas Tech University, Box 42125, Lubbock, TX 79409-2125

ERNEST B. Fish, Department of Range, Wildlife, and Fisheries Management, Texas
Tech University, Box 42125, Lubbock, TX 79409-2125

ROBERT BAKER, Department of Biological Sciences, Texas Tech University, Box
43131, Lubbock, TX 79409-3131

HEATHER WHITLAW, Texas Parks and Wildlife Department, Box 42125 TTU,
Lubbock, TX 79409-2125

Texas Tech University (TTU) and Texas Parks and Wildlife Department (TPWD) have developed a long-standing relationship in the research of swift foxes (*Vulpes velox*) in Texas. Increasing our capacity for swift fox conservation and management through improved understanding of the species' ecology continues to be a priority in this partnership. Donelle Schwalm joined the Department of Range, Wildlife and Fisheries Management at TTU in January 2005, and will be conducting graduate research on swift fox ecology in the panhandle of Texas under the supervision of Dr. Warren Ballard. Texas Parks and Wildlife Department is providing funding and logistic support during the project.

The primary objectives of this study are:

1. Identify available potential swift fox habitat in the Texas panhandle and determine the current distribution of swift foxes within the area defined by Mote (1998).
2. Identify factors influencing likelihood of patch occupancy by swift fox, including size, proximity of other inhabited patches, surrounding habitat matrix, and presence of potential dispersal barriers.
3. Identify genetic patterns exhibited within the study area, including subpopulation-level structuring, gene flow rates between subpopulations, and outside immigration rates.
4. Identify factors influencing regional genetic diversity of swift fox, including environmental, topographical or habitat-oriented correlates to subpopulation boundaries and dispersal corridors.

Although once considered abundant throughout the short to mid-grass prairies of North America, the swift fox has experienced range-wide declines. Habitat loss and

subsequent fragmentation have been implicated as contributing factors in this decline (Allardyce and Sovada 2003). Grassland systems in the Great Plains region have undergone rapid and extensive alteration through urbanization, infrastructure development, alteration of historic grazing and fire regimes, and conversion for agriculture. Estimates indicate less than 30% of mixed grass prairie remains, primarily in a fragmented condition (Samson and Knopf 1994). As a result, remnant swift fox populations occur largely in spatially disjunct habitat fragments, even at a local scale. Anthropogenic alteration of swift fox habitat in Texas has paralleled range-wide trends, with >80% of grasslands lost (Samson and Knopf 1994). At least 50% of the species' historic range in Texas is unsuitable for use (Jones et al. 1987). While little quantitative data exists, anecdotal evidence suggests the majority of remaining habitat occurs in isolated patches distributed unevenly across the landscape.

Understanding of habitat fragmentation's impact on the long-term viability of swift fox populations is limited. Previous research on swift fox has occurred primarily in continuous natural habitats, or has considered them as such, and focused largely on within-territory activities. Existing research on extra-territory movements (e.g., forays, dispersals) typically addresses the influence of predator presence or demographic variables such as individual age and sex, rather than habitat parameters. To date, no studies have reported the influence of habitat fragment characteristics (e.g., size, proximity to other fragments, surrounding habitat matrix) on patch occupancy, dispersal between patches and intra-population genetic diversity in swift foxes. These factors often are negatively influenced by habitat fragmentation and are highly applicable to conservation efforts designed to promote long-term species persistence.

Further research concerning the effect of habitat fragmentation on swift fox populations is necessary for development of appropriate conservation measures throughout the species' range. We will use molecular and geospatial techniques to determine the distribution of swift fox in Texas and study the interaction between habitat fragmentation and regional genetic diversity. Swift fox surveys and sample collection will occur in grassland remnants identified in 34 counties located in the northern panhandle of Texas. Aerial imagery will be reviewed to determine the location of grassland habitat fragments within the study area. A GIS coverage delineating individual patch boundaries and area will be developed before surveys begin. All remnants will be surveyed between July and November once per year for two years, using the scat survey method described in Harrison et al. (2002). Surveys will be conducted on state and federal properties, as well as private property whenever access is granted. Live trapping will occur where swift fox are detected. A 0.3-0.5g tissue sample will be collected for DNA analysis. Scat and tissue samples will be stored in lysis buffer until analyzed. Sampling location will be recorded using a hand-held GPS unit and entered in a GIS layer. Vegetation height, type, and topography will be measured at trap sites and surrounding habitats. Tissue sample analysis will follow standard protocols using 9-11 canid microsatellite markers (Harrison et al. 2002, Kitchen 2004).

Two scenarios regarding the influence of habitat structure on swift fox genetic patterns exist. First, habitat fragmentation may not influence dispersal rates, resulting in a continuous population with low levels of genetic differentiation. Conversely, habitat fragmentation may reduce dispersal rates, negatively influencing gene flow between

population fragments. Over time, differentiation between fragments may result in distinct subpopulations. Subpopulation-level differentiation will be tested for using the Monmonier (1973) method and the Bayesian test available in STRUCTURE (Pritchard et al. 2000). These tests were chosen because neither requires *a priori* assumptions of population structure. In addition, Monmonier's method may be more effective when sampling continuous populations where genetic and geographic boundaries are not readily apparent. Source populations for individuals will be determined using assignment tests described by Pritchard et al. (2000) and Vazquez-Dominguez et al. (2001), and the exclusion test described by Cornuet et al. (1999). The use of multiple tests is desirable as results vary by test, requiring the comparison of results between tests for assignment to the appropriate source population. The exclusion test is valuable because, unlike the assignment tests, it does not assume all source populations were sampled. Thus, individuals can be assigned to an immigrant cohort, indicating origination outside the study area. Subpopulation groupings generated by each method will be tested for Hardy-Weinberg and linkage equilibrium.

Individuals will be mapped according to sampling location using GIS. The ArcView extension Animal Movement will be used to identify geographic population boundaries by defining a 95% minimum convex polygon for each subpopulation grouping (Cegelski et al. 2003). Subpopulation boundaries will be overlaid with topographic, climatologic and aerial photography coverages in ArcView to identify correlates with population boundaries. In addition, geospatial analysis will be conducted to assess the relationship between patch characteristics (e.g., spatial distribution, size, surrounding habitat matrix, proximity to inhabited patches) and swift fox use.

LITERATURE CITED

- Allardyce, D. and M. A. Sovada. 2003. A review of the ecology, distribution, and status of swift foxes in the United States. Pp 3-18 in M. A. Sovada and L. Carbyn (eds.). The swift fox: ecology and conservation of swift foxes in a changing world. University of Regina, Regina, Saskatchewan, Canada.
- Cegelski, C. C., L. P. Waits and N. J. Anderson. 2003. Assessing population structure and gene flow in Montana wolverines (*Gulo gulo*) using assignment-based approaches. *Molecular Ecology* 12: 2907-2918.
- Cornuet, J. -M., S. Piry, G. Luikart, A. Estoup, and M. Solignac. 1999. New methods employing multilocus genotypes to select or exclude populations as origins of individuals. *Genetics* 153: 1989-2000.
- Harrison, R. L., D. J. Barr and J. W. Dragoo. 2002. A comparison of population survey techniques for swift fox (*Vulpes velox*) in New Mexico. *American Midland Naturalist* 148: 320-337.
- Jones, J. K., Jr., C. Jones, R. R. Hollander and R. W. Manning. 1987. The swift fox in Texas. Texas Tech University, Unpublished Report. Submitted to Texas Parks and Wildlife Department, Austin, Texas, U. S. A.

- Kitchen, A. M. 2004. Social and spatial ecology of the swift fox (*Vulpes velox*) in southeastern Colorado. Dissertation. Utah State University, Logan, Utah.
- Longmire, J. L., M. Maltbie, and R. J. Baker. 1997. Use of “lysis buffer” in DNA isolation and it’s implication for museum collection. Museum of Texas Tech University, Occasional Paper #163.
- Mote, K. 1998. Conservation strategy for the Texas Panhandle short grass prairie. Final Report to Federal Aid in Wildlife Restoration, and USFWS Section 6 Grant Program. Texas Parks and Wildlife Department, Austin, Texas, USA.
- Monmonier, M. 1973. Maximum-difference barriers: an alternative numerical regionalization method. *Geographic Analysis* 3: 245-261.
- Pritchard, J. K., M. Stephens, and P. Donnelly. 2000. Inference of population structure using multilocus genotype data. *Genetics* 155: 945-959.
- Samson, F. B. and F. L. Knopf. 1994. Prairie conservation in North America. *BioScience* 44:418-421.
- Vazquez-Dominguez E., D. Paetkau, N. Tucker, G. Hinten and C. Moritz. 2001. Resolution of natural groups using iterative assignment tests: an example from two species of Australian native rats (*Rattus*). *Molecular Ecology* 10: 2069-2078.

IMPORTANCE OF ARTIFICIAL ESCAPE COVER FOR INCREASING SWIFT FOX POPULATIONS IN NORTHWEST TEXAS

BRADY K. MCGEE, Department of Range, Wildlife, and Fisheries Management, Texas Tech University, Lubbock TX 79409-2125, USA

WARREN B. BALLARD, Department of Range, Wildlife, and Fisheries Management, Texas Tech University, Lubbock TX 79409-2125, USA

KERRY NICHOLSON, Department of Range, Wildlife, and Fisheries Management, Texas Tech University, Lubbock TX 79409-2125, USA

The following is a verbatim copy of the abstract of a presentation at the 39th Annual Meeting of the Texas Chapter of the Wildlife Society (19-21 February 2004, Kerrville, TX). Permission to reproduce this abstract in its entirety was received from Dr. Warren Ballard (Department of Range, Wildlife, and Fisheries Management, Texas Tech University, Lubbock TX; warren.ballard@ttu.edu).

Currently, coyotes are thought to be the primary mortality factor of swift fox. Research has suggested that swift fox survival is reduced in areas with high coyote abundance. Because swift fox use dens year-round for protection from predators, we hypothesize that lack of den sites and escape cover may limit swift fox populations in northwest Texas. In order to test our hypothesis, artificial escape dens were installed at a private ranch (PR) in Sherman County, and on the Rita Blanca National Grasslands (NG) in Dallam County, Texas. From 01 January to 31 December 2002, we captured and radio-collared 46 swift fox in 1,187 trap-nights. Scat transects revealed higher coyote abundance on NG (3.22 scats/transect) than on PR (0.11 scats/transect). On NG, annual swift fox survival in artificial escape den treatment areas was 0.88, but in untreated areas survival was 0.38. On PR where coyote abundance was low, annual swift fox survival was 0.89 in untreated areas and 0.88 in treatment areas. We also found that swift fox in treatment areas had higher recruitment (2.8 young/adult) than in untreated areas (1.9 young/adult) for both study sites combined. Results from the first year of the study have supported our hypothesis. In areas with high coyote abundance, artificial escape dens have helped increase swift fox survival, but in areas with few coyotes, artificial dens have had little effect.

**SWIFT FOX (*VULPES VELOX*) OCCURRENCE IN BLACK-TAILED
PRAIRIE DOG (*CYNOMYS LUDOVICIANUS*) TOWNS
IN THE NORTHWESTERN PANHANDLE OF TEXAS**

KERRY NICHOLSON, Department of Range, Wildlife, and Fisheries Management,
Texas Tech University, Lubbock TX 79409-2125, USA

WARREN B. BALLARD, Department of Range, Wildlife, and Fisheries Management,
Texas Tech University, Lubbock TX 79409-2125, USA

BRADY K. MCGEE, Department of Range, Wildlife, and Fisheries Management, Texas
Tech University, Lubbock TX 79409-2125, USA

The following is a verbatim copy of the abstract of a presentation at the 39th Annual Meeting of the Texas Chapter of the Wildlife Society (19-21 February 2004, Kerrville, TX). Permission to reproduce this abstract in its entirety was received from Dr. Warren Ballard (Department of Range, Wildlife, and Fisheries Management, Texas Tech University, Lubbock TX; warren.ballard@ttu.edu).

Black-tailed prairie dog (*Cynomys ludovicianus*) colonies provide a unique habitat that influences the abundance and species composition of birds, small mammals, and large herbivores. Biologists have concluded there are several prairie species that are dependent on prairie dogs, and the swift fox (*Vulpes velox*) is among those species. In 1999, swift fox research was initiated on the Rita Blanca National Grasslands (RBNB) in the northwestern panhandle of Texas. To date, we have radio-collared and followed the movement of 50 swift fox. The perimeter of prairie dog towns on the RBNB was mapped using a GPS unit in 1999, 2001 and 2003. Telemetry and capture locations of fox were used to determine if there was preferential selection of prairie dog habitats. In 1999, 586 fox locations were collected, of those 8 were within the perimeter of a prairie dog town. In 2001, 165 locations were obtained, and 7 were within a dog town. In 2002, 282 locations were recorded and 8 of those were in a prairie dog town. Swift fox appear to use prairie dog areas proportionally less than their availability.

**MINUTES FROM THE 2005 ANNUAL MEETING
SWIFT FOX CONSERVATION TEAM**

**CABELA'S, KANSAS CITY, KANSAS
MARCH 22-23, 2005**

EILEEN DOWD STUKEL, South Dakota Department of Game, Fish and Parks, 523 East Capitol, Pierre, SD 57501. Tel: 605-773-4229; FAX: 605-773-6245; E-mail: eileen.dowdstukel@state.sd.us

JULIANNE WHITAKER HOAGLAND, Oklahoma Department of Wildlife Conservation, 1801 N. Lincoln Blvd., Oklahoma City, OK 73105. Tel: 405-522-0189; FAX: 405-521-6535; E-mail: jhoagland@odwc.state.ok.us

NOTE: See the end of the meeting notes for a list of meeting participants and a list of tasks generated at this meeting.

Tuesday, March 22, 2005

Matt Peek, SFCT Chair, began the meeting at 9:18 am by leading introductions. No changes were made to the agenda.

AGENCY REPORTS:

Kansas: Matt Peek reported that standardized monitoring continues; Kansas harvests a small number of swift fox each year (about 86 most recently); monitor populations with track search surveys, which were conducted in 3 of the past 5 years; they also ask for employees to turn in any swift fox reports throughout the year.

Montana: Brian Giddings said that a replicate distribution survey (at 5-year intervals) will be done this fall; they are also working with Canada on 2005-06 International Swift Fox Census; they also collect other swift fox data incidentally and conduct some limited track surveys; Fort Peck Reservation is conducting swift fox work, with Kyran Kunkel assisting with capture and collaring of animals to assess the potential for reintroduction.

North Dakota: Marsha Sovada reported for NDGFD; there are still no documented swift fox in North Dakota; a survey is scheduled for this year in association with grouse surveys in 4 counties in southwestern North Dakota; there was a report of a possible swift fox in Teddy Roosevelt National Park, but no evidence was provided; Jacquie Ermers should be replaced by May, 2005; in the meantime, Randy Kreil is the SFCT contact for NDGFD.

APHIS: Jeff Green reported that the swift fox is not a target animal for APHIS, although they are sometimes taken unintentionally; pan tension devices are used by their personnel to reduce take of nontarget species; incidental takes are reported to individual states.

USFWS: Pete Gober stated that addressing the current Notice of Intent filed with the Service will involve much more biology than previous legal challenges.

Nebraska: Sam Wilson replaced Richard Bischoff on the SFCT; they will start scent station surveys soon, although the schedule has not yet been determined.

New Mexico: Jim Stuart replaced Chuck Hayes on the SFCT; Rob Harrison of the University of New Mexico established 99 transects and initiated scat surveys; Rob published a paper in American Midland Naturalist on the initial surveys, which were repeated in 2003 and will be done again in 2005; they are seeing some differences in the second survey (2003); 2005 survey will hopefully help identify why results differed during the previous two surveys; swift fox can be harvested in New Mexico; the maximum taken in last 10 years ranges from 40-50/year; there has been an increase in recent years in total taken, based on harvest surveys; New Mexico has no pelt tag system for swift fox.

South Dakota: Eileen Dowd Stukel reported that the state did not conduct swift fox surveys during 2004; surveys will be conducted in 2005, using Section 6 funds, to continue to learn more about the population in Fall River County; the work will be conducted by Jon Jenks of South Dakota State University, using both scent stations and trackable surfaces searching.

Oklahoma: Julianne Hoagland reported that 57 of 102 townships had swift fox sign during 2004; there were good tracking surfaces in the Oklahoma panhandle, compared to very dry conditions in 2000; OSU has completed a research report on population density work.

Colorado: Francie Pusateri described their use of 12 square-mile random trap grids, using a mark/recapture index on 3 consecutive trap nights; there are 51 grids statewide; a previous study, conducted by Darby Finley, favored the best habitat types; current survey includes additional habitat types; preliminary results indicate that, in general, there were no changes in swift fox distribution in Colorado since 1999; they found lower densities in agricultural areas that lack shortgrass prairie; they caught swift fox on 71% of the grids; blood was drawn for disease analysis; they found much higher plague titers this year than last, but wetter conditions existed and more plague occurred in prairie dogs this year; 8% of the samples had titers for tularemia; they found no distemper titers; hair was pulled for genetics analysis, in association with a student working on Pawnee National Grassland; a final report on this study should be published by mid-summer, 2005 by Colorado Division of Wildlife.

Texas: Heather Whitlaw was not present. Doni Schwalm, Texas Tech University graduate student, reported that distribution surveys will start in July, 2005 in the Texas panhandle using Rob Harrison's techniques.

Wyoming: Martin Grenier was not present.

COMMITTEE REPORTS:

Education Committee (Eileen Dowd Stukel): One of the tasks of this committee has been to prepare a news release template following the SFCT meeting; the template can then be customized by individual states and partners and distributed in their respective news outlets; Pete will finalize the most recent edition of the newsletter in a month.

Pete stressed the importance of keeping the record up to date with accomplishments to help with legal challenges; states and partners should recommit to swift fox and continue posting important documents that demonstrate that continued commitment; Pete suggested that the SFCT submit a Freedom of Information Act (FOIA) request to the USFWS to obtain a copy of the Administrative Record, which the litigants will have; Pete speculated that states will likely be carrying a heavier load regarding ESA litigation in the future; Matt has been working within his agency to submit the FOIA, and he plans to complete that task rather than pass it on to the next chair; there was a discussion about the future role of litigants at meetings and in email correspondence, including a discussion about the similarity between the SFCT and PDCT; SFCT members may be more conservative about distributing draft documents with all interested entities, in view of litigation.

Habitat Committee (Matt Peek and Julianne Hoagland): Wildlife Habitat Council leaflet was reviewed by team members (Julianne, Lu Carbyn, Marsha and Matt); Matt will inform members when it is finalized; the SFCT had previously planned to prepare a swift fox brochure for landowners, but this idea was put on hold because of the WHC's document; Is a separate brochure needed now? Julianne stated that a separate leaflet could be habitat/plant community-oriented, rather than have a single species orientation; this approach will be consistent with states' habitat planning in Comprehensive Plans and Strategies; Pete Gober described a programmatic consultation between USFWS and Natural Resources Conservation Service (NRCS) on Topeka shiners; the process allowed the Service to review NRCS practices for other species as well; this approach has spread to other states via NRCS, and this can be an opportunity to influence NRCS practices.

OTHER TOPICS:

Distribution map: Marsha described background related to the 1999 distribution map; this map had some mistakes that were pointed out by Martin Grenier. Martin is questioning the trapper survey records that were published (Woolley 1995) in the Team's annual report. Marsha suggested that the previous distribution map published in the 1999 Team Annual Report be modified to reflect this change. It's extremely important to use the best information available that is defensible; Pete raised the question of what constitutes a significant portion of a species' range, based on a recent court case; Marsha reminded everyone to notify her of any problems associated with the historical or current distributions (found in the 1999 SFCT report) so that the updated map will reflect an accurate assessment of the historic distribution. There still are issues regarding resolution of taxonomic issues between swift and kit fox (Jerry Dragoo article in prep).

Marsha updated the group on the habitat mapping and modeling work she is doing using funds provided by BLM Montana/Dakotas State Office. She is using Kansas as a test

case because the state has the best soils data and the most complete survey data to evaluate the ability to predict swift fox distribution with habitat variables. Marsha cautioned the group not to expect definitive answers from the work, as swift foxes are relatively adaptable.

Timeline for published map: Marsha believes it is reasonable to build a distribution map every 5 years; Marsha will send everyone an excel file to complete by county, to include where surveys were done and what effort and techniques were used, rather than just sites/counties where swift fox were detected; Among questions raised: How do we get at persistence over time? How persistent are the threats to the species? Presence/absence by county is what the SFCT determined would be the minimum survey and reporting standard.

ESA Lawsuit: Pete Gober reported that several organizations are involved in the challenge to the 2001 decision to remove the swift fox from the candidate species list - Forest Guardians; Predator Conservation Alliance; Great Plains Restoration Council, and Center for Biological Diversity; 60-Day Notice of Intent to Sue was received on December 9, 2004; USFWS' draft response is currently in their regional office; Lauren McCain stated that the groups involved in the litigation are interested in seeing long-term recovery of swift fox; on a related note, a FOIA request will be filed with the Service by states participating on the Prairie Dog Conservation Team.

Annual Report: Matt reported that bound and unbound copies and a CD of the 2003 report will be distributed soon; Martin asked Matt to emphasize that participants should provide timely information when deadlines are given; Matt suggested that all state agencies should turn in reports for the annual report, even if they did not conduct surveys that year; the final protocol for sending tissues to the University of New Mexico Museum of Southwestern Biology is included in the 2003 annual report; the group discussed whether tissue samples from captive animals should be submitted – only tissue from animals that will be released should be submitted, although we should continue to encourage people to submit samples.

Status of Tasks from 2003 meeting:

- FS planning effort – Martin contacted the Forest Service regarding planning deadlines; northern grasslands comment opportunity had passed; southern grasslands planning period is upcoming
- Disease issue - swift fox book has a chapter on diseases and parasites, and participants felt that the chapter adequately addressed this issue; Badlands National Park will be submitting a manuscript on disease results of swift fox captured in Colorado; TESF would like to change their protocol that prohibits plague-positive titered animals into SD (this protocol is also true BNP); Sam Holland, SD State Veterinarian, has asked specific questions related to the protocol that TESF is working on, in cooperation with Toni Roche and previously with Beth Williams
- NRCS representative on SFCT – Francie stated that a regional NRCS biologist would be most appropriate, but NRCS regions divide the states with swift fox (one regional biologist is in Oregon and the other is in Fort Worth, Texas {Bill Holman}); if Bill

Holman is not interested in participating, we should consider a state NRCS person with an interest in swift fox

REINTRODUCTION PROJECTS:

Bad River Ranches: Kevin Honness reported on status of project for the years 2002-2004; 153 animals captured with equal male/female and adult/subadult ratios; translocated 89 (42 males, 47 females) (37 adults, 52 subadults) captured during 4 trapping sessions in WY; some foxes have shown good fidelity to their temporary release structures; hard released 59, soft released 18; 15 pups born in captivity, 27 wild-born pups; fall post-release monitoring conducted with daily contacts attempted; overall, 42 animals (55%) alive, or 30 animals (39%), if missing are included (this is not an annual survival rate); coyote control continues during the reintroduction process

Badlands National Park: Greg Schroeder described the status of this project, which began with a fall 2003 reintroduction using animals captured in Colorado; they tried to release foxes in gaps between known coyote territories; half of the foxes were put in random locations, others fit between known coyote territories (based on coyote use of a 50% core area); their swift fox habitat suitability model used data from the SD GAP project; all releases were on the North Unit of BNP, and all were released in pairs or 2 females/1 male; used hard releases in 2003, soft and hard releases in 2004 (their definitions of hard and soft releases differ from those of Bad River Ranches); summer 2004 - 3 litters born, 15 pups; 7 animals from the 2003 release are still alive today; trapped 12 pups to radio collar; as of March 2005, 6 of 15 pups were monitored; 20 of 28 animals from the 2004 release are alive; population estimate – 33 animals; coyotes are the main mortality cause; had less immediate dispersal with the second year's release (due to "soft" release or presence of swift fox scent already?); they're not seeing a strong relationship to prairie dogs in general; is there coyote avoidance on PD towns?

Lower Brule Sioux Tribe: Shaun Grassel described a feasibility study funded with a Tribal Wildlife Grant; used habitat work from prairie dog study as their habitat framework plus grassland bird densities; also did burrowing owl surveys, pitfall trapping in combination with drift fences, grasshopper surveys, small mammal trapping in "webs", coyote fecal line transect surveys, and prairie dog surveys and mapping; they are collecting blood from hunter/trapper killed coyotes and collecting blood from coyotes taken during complaints; have done public involvement with favorable responses, in general; reintroduction of swift fox was recently authorized by their Tribal Council; currently seeking funding; hope to release foxes in fall of 2006; have contacted State of Kansas as potential source of swift fox; Matt Peek's response is that Kansas will participate as long as the translocation is viewed favorably by State of South Dakota; questioned about their prairie dog incentive program - paying land operators \$20/acre to leave prairie dogs on the land; current acreage is 2900+ acres (agreements cover more than half the current acreage); an individual agreement lasts for the duration of their grazing lease; hope to release black-footed ferrets at some point, possibly at same schedule as swift fox. Brian Giddings suggested that Montana may be at a point (population size) to provide an additional source of wild foxes for the reintroduction. An assessment of population status will be made following the 2005-06 census with Canada.

Blood Reservation: Karen Bauman stated that zoos sent 8 animals to Clio Smeeton of Cochrane Ecological Institute for breeding in captive facility. From her conversations with Clio, Karen understood that 10-20 CEI animals had been released in late 2004. Karen was also told that more post release monitoring was planned as compared to previous projects associated with CEI.

Blackfeet Reservation: David Ausband reported that the reservation has 1.5 million acres; wild-born kits have been observed every year since initial release in 1999; goals were to have a growing population of at least 100 animals; they evaluated potential population estimation methods, which included: radio collaring adults, estimating kits early and late summer, small mammal monitoring, soliciting information from landowners, visual surveys; mortalities: coyotes and raptors are the main known factors; the population has met lambda goal; 83 animals observed in 2004, 14 natal dens located in 2004; 2 adult swift fox captured in Augusta, Montana (69 miles from reintroduction site); lower small mammal capture rates than anticipated; did some visual survey work, but analysis remains to be done to determine detectability, based on radioed animals

Taxonomy: Group members don't anticipate that Bob Wayne or IUCN will undertake the taxonomic issue; once Jerry Dragoo's paper is published, there may be rebuttals to his perspective.

Status of Canada/US 2005-06 census planning effort: Brian Giddings updated the group on this census, which will be a repeat of 2000-01 census; Canada released more than 900 foxes, initially captive animals, then wild foxes used in releases; population is established in southern Alberta and Saskatchewan; census conducted in 1995-96 and repeated in 2000-01 in cooperation with Montana; selected 75% of townships for live-trapping as census method; trying to determine current population status; have documented a 3-fold increase in distribution and abundance since 1995; will be adding townships during this census to determine expansion areas; comprised of a 3-4 month sampling period during the winter; \$360,000 budget for both Montana and Canada; population estimate – 1,000 foxes (international population); plan to collect DNA samples and disease samples during this year's census; also plan to work more with GIS habitat modeling during this year's census.

Canadian Swift Fox Recovery Team: Brian Giddings reported that Axel Moehrensclager is the current chair; plan to revise recovery strategy; hope to include some socioeconomic information

Canid TAG Working Group/AZA: Karen Bauman provided a brief background on the Canid TAG, which oversees captive conservation programs for canid and hyaenid species in AZA zoos. Karen had previously come to the SFCT to discuss role of captive population and subsequently the SFCT had recommended that the captive population be maintained (linked to existing conservation efforts). Karen reported that the AZA Canid TAG had created a Species Survival Plan program (SSP) (highest level) to fulfill this recommendation. She then introduced the new SSP Coordinator, Marilyn McBirney, who will serve as the liaison between Team and TAG and will manage captive program with the help of Kim Shotola, the new AZA Swift Fox Studbook Keeper.

The Swift Fox SSP will draw from the best parts of other successful canid programs and will continue the partnership between the AZA and the SFCT. The program has four key areas:

Education: this will be the primary focus of the swift fox captive program as zoos have over 130 million visitors/year at AZA institutions. The SSP will to work with SFCT Education Committee to identify the key messages for landowners, the public, etc. For example, why are swift fox important or special components within a particular state? The SSP will then coordinate these educational messages among all the swift fox captive facilities. Additionally, the SSP will strive to provide an opportunity for better information sharing between state agency people and AZA so that each group has a better appreciation for the strengths of the other.

Research: captive animals present research opportunities for the SFCT needs and the SSP can help facilitate specific requests from the SFCT to AZA member institutions. During the discussion regarding sending AZA animals for the Blood Tribe's reintroduction (see Blood Tribe section for details), Axel suggested that an experiment evaluating the success captive foxes for reintroduction might be valuable given the data we now have from hard vs soft releases and the monitoring techniques available. Previous data on this are a bit sparse. Also, not all research efforts need to focus on swift fox, for example the Island fox (*Urocyon littoralis*) captive breeding program (currently run by the National Park Service) is having trouble with F2 generation breeding success. Since swift fox breed well in captivity, captive husbandry techniques could be tested and technologies transferred to assist in this endangered species program.

Genetic reservoir/captive breeding: The AZA's Population Management Center evaluated studbook data and determined the captive population is in good shape. However, to maintain gene diversity long term (50-100 years) there are two options: normal - maintain population as is, a closed population with no new animals added which would have a target population size of 100 animals and would result in 58% gene diversity at 100 years. The other option is a new integrated model, which would utilize the wild population to obtain new genetic material periodically to create semi-closed population. This model would require about 10 founders every 10 years and the wild population source must have no connection to the captive population, but would only need a target population size of 60 animals and would result in 85% gene diversity at 100 years. NOTE: this new integrated population model would be the first of its kind.

Linking in-situ and ex-situ: 18 AZA facilities have swift fox, most of these are smaller facilities within the swift fox range – they want to get involved in field projects existing in their states. This will 1. help the zoo staff better understand, and therefore better communicate the issues to the public and, 2. allow customization of the message by state. Facilities not in range states could either partner with a range state or feature a prairie ecosystem approach. The goal is to have a seamlessly-integrated program in educational, research and captive breeding efforts.

Pete will assist with this effort on the Education Committee; Greg offered Badlands National Parks as a reintroduction demonstration site to be visited and/or highlighted by AZA facilities.

Next step in this coordination process is to get approval to explore plan for periodic addition of founders. Karen shared a handout with a draft proposed program structure for the swift fox SSP for the SFCT to review and comment on.

Wednesday, March 23, 2005

AZA issue: SFCT supports an open program in which the states will give them wild foxes to supplement breeding stock; potential opportunity to use Colorado foxes that test positive for plague as founders (Francie Pusateri will pursue).

Protocol for specimen deposit: Whoever stores specimens at the New Mexico Museum of Natural Science retains ownership of the specimens, but the protocol isn't clear on that issue; Research Committee (Marsha and Doni) will work on a tissue protocol update.

Conservation Strategy Update: SFCT agreed to make changes in the 1997 document to bring it up to date; examples of changes needed:

- Executive Summary – add OK and TX to contiguous range
- Introduction – same
- Status:
 - historic information – add the 1999 annual report chapter information on historic records and new citations
 - new citations for research that reflect new information to the status section of the report.
 - add new maps and graphics – show most recent information to replace the maps that are in the 1997 document; 10-year map; instead of three maps use one color map.
 - add tribes to those with swift fox management authority along with states under Management Status.
- risk Assessment - update
- strategy portion of document should list action items have been completed.

Conservation Assessment: All SFCT members should read through the 1997 document and suggest changes; state, tribal and other agency members should review the information pertinent to their issues in the Conservation Assessment by June 30; Eileen will coordinate comments on this section, and Brian, Marsha and Eileen will serve as editors; Brian will send out the document in MS Word and members will use Track Changes to make their comments.

Conservation Strategy:

- need to identify which strategies have been accomplished within the document
- need to reflect changes in priority of strategies based on new information

- check off those items that have been achieved and those that have not been completed - they may be reprioritized; give justification for changes in priority
- add new items if necessary based on new information
- NEED TO summarize the progress that has been made since the original document; need to provide the results of the achieved actions and strategies

Francie, Julianne and Matt will serve as a committee to review and edit (with the help of the whole SFCT) the Strategy section. Start with the strategy matrix Julianne put together a few years ago that has the 1997 priorities and due dates. Need to see the progress that has been made first before we reset priorities. Have the Assessment and Strategy committees work on parallel tracks; the two committees need to communicate with each other shortly after this meeting.

Send information in either MS Word track changes or in the matrix format that Julianne will e-mail out. SFCT will sit down next year and set priorities and new timelines if necessary.

Monitoring: – standardize protocol?; article on Kansas swift fox surveys will be in the next JWM; guidelines by Marsha and Glen Sargeant are in the most recent annual report (2003); can we standardize monitoring or does each state need to do what works best for them? SFCT needs to think about this.

Bibliographies: Continue to send Marsha updates to the swift fox bibliography on Northern Prairie's website; Marsha will also update the bibliography section of the 1997 document accordingly

SFCT administrative positions: – Brian Giddings, Chair and Francie Pusateri, Co-Chair; Next meeting will be held 1 year from now (March 22 or so); Brian offered Montana, possibly Great Falls; 2004 Annual Report Editors – Jim (NM) and Sam (NE) – deadline for submissions will be May 1. This is for work done in calendar year 2004; No state blanks! (provide a report even if your state did not conduct survey work); 2005 meeting notes will be included in the 2004 report

BREAK

Proposed state/agency changes in swift fox status and management:

Montana (Brian Giddings) – restricted harvest in northcentral Montana; there has been incidental take even with pan tensions so Montana may propose a restricted season in a 3-county area where swift fox densities are highest to allow trappers to possess swift fox that are incidentally taken; would require pelt tagging and registration; November 1 – March 1 season would coordinate with bobcat season and tagging program. Carcasses would be surrendered to Department for research. Will develop a database. Swift fox are present in 16 out of 22 counties that have suitable habitat. Trapper survey indicated that swift fox populations have increased significantly over the past 3 – 5 years. Limit one swift fox per trapper with a quota of three swift fox in the northern portion of those three counties, north of Highway 2. Trappers currently surrender the entire carcass including the pelt. This would allow trappers to keep the pelt only. This would help maintain

harvest pressure on coyotes instead of trappers backing off coyote trapping to avoid incidental take of swift fox. Montana will look at 2005-06 survey and census data first and any changes would be for the 2006-07 trapping season. Pan tension is voluntary. Law enforcement issue is sensitive. Suggested by Team that maybe do a lottery at the end of the season to protect incidental take so that three pelts could be kept total, one per trapper. Intent is to allow trappers who incidentally take swift fox to keep the pelts. Right now 2 to 3 swift fox are **reported** incidentally taken each year. Can always close the season if the proposed limited harvest doesn't work.

Management and Research Plans 2005-06:

- Colorado – finished survey in 2004, report due in 2005; grassland species plan completed; current collecting permit with Badlands Park and will be collecting fox in 05
- Kansas – just completed track survey cycle in 2004; no track surveys in 05
- Texas – surveys in July – November in 05, 06. Rita Blanca NG has artificial den structures
- New Mexico – scat surveys in spring 05, replicate of 2003 survey; trying to do survey every two years with analysis within 6 – 12 months; data may not be available until 06
- Nebraska – track surveys in 05
- Montana – replicate distribution survey; census with Canada in 05-06. Investigate increasing census area. Glasgow wind power farm, pre-development live-trapping monitoring area; and three county scent post surveys for long-term monitoring of population trends
- Oklahoma – track survey completed in 04, report completed in 05 with additional habitat evaluation
- South Dakota – already described under state report

Meeting adjourned at 11:55 am.

Task list from SFCT Meeting, 22-23 March 2005

Task	Responsible person	Deadline	Status
Distribute draft meeting notes and provide final version for 2004 Annual Report	Eileen Dowd Stukel	May 1, 2005	
Provide corrections to draft meeting notes to Eileen Dowd Stukel	2005 meeting participants	April 25, 2005	
Prepare template news release for members to customize with their local information about swift fox for use in their news outlets	Eileen Dowd Stukel	none set	
Submit current newsletter items or changes to Eileen	All	May 1, 2005	
Complete questionnaire on Newsletter Issues/Questions	All	May 1, 2005	
Post final SFCT newsletter on USFWS website	Pete Gober	June 1, 2005	
Submit comments to Marsha on her draft distribution document/revised maps (not including 2004 data that are currently being submitted to Marsha); review appendix in 1999 report	All	June 15, 2005	
Review appendix information in Marsha's 1999 paper on distribution and notify her of any changes needed	All	June 15, 2005	
Determine status of swift fox samples at Wyoming State Vet Lab, formerly maintained by the late Dr. Beth Williams	Francie Pusateri	none set	
Identify a disease expert willing to assist the SFCT when needed	Francie Pusateri	none set	
review and send comments on the SSP/SFCT program structure document to Marilyn McBirney	All	none set	
Matt will visit with Heather about asking the Fort Worth NRCS person to join the SFCT	Matt Peek and Heather Whitlaw	none set	
Send comments on draft response to NOI to Matt	SFCT members	April 15, 2005	
Distribute electronic version of CACS document in MS Word	Brian Giddings	ASAP	
Distribute strategy matrix document in MS Word	Julianne Hoagland	ASAP	
Send comments on Conservation Assessment portion of CACS to Eileen using MS Word and track changes feature	All	June 30, 2005	
Send comments on Conservation Strategy updates and additions to Julianne	All	June 30, 2005	
Provide submissions for 2004 Annual Report to Jim Stuart and Sam Wilson	All	May 1, 2005	

2005 SFCT Annual Meeting Participants, 22-23 March 2005

Name	Representing	Email Address
Matt Peek	Kansas Dept. of Wildlife and Parks	mattp@wp.state.ks.us
Brian Giddings	Montana Fish, Wildlife and Parks	bgiddings@mt.gov
Greg Schroeder	NPS – Badlands National Park	greg_schroeder@nps.gov
Marsha Sovada	U.S. Geological Survey	marsha_sovada@usgs.gov
Karen Bauman	St. Louis Zoo	kbauman@stlzoo.org
Marilyn McBirney	Pueblo Zoo	curator@pueblozoo.org
Kim Shotola	Houston Zoo	kshotola@houstonzoo.org
Rick Gilliland	USDA-APHIS-Wildlife Services	rickey.l.gilliland@aphis.usda.gov
Jeff Green	USDA-APHIS-Wildlife Services	jeffrey.s.green@aphis.usda.gov
Pete Gober	USFWS	pete_gober@fws.gov
Sam Wilson	Nebraska Game and Parks Commission	sam.wilson@ngpc.ne.gov
Kevin Honness	Turner Endangered Species Fund	honness@wcenet.com
Shaun Grassel	Lower Brule Sioux Tribe	shaung@cableone.net
Jim Stuart	New Mexico Dept. of Game and Fish	jstuart@state.nm.us
David Ausband	University of Montana	daveausband@yahoo.com
Doni Schwalm	Texas Tech University	doni.schwalm@ttu.edu
Eileen Dowd Stukel	SD Dept. of Game, Fish and Parks	eileen.dowdstukel@state.sd.us
Julianne Hoagland	OK Dept. of Wildlife	jhoagland@odwc.state.ok.us
Francie Pusateri	CO Division of Wildlife	francie.pusateri@state.co.us
Cal McCluskey	Bureau of Land Management	cal_mccluskey@blm.gov
Deb O'Neill	Prairie Dog Conservation Team	pdogoneill@aol.com
Lauren McCain	Forest Guardians	lmccain@fguardians.org